

FIG. 1

BEST AVAILABLE COPY

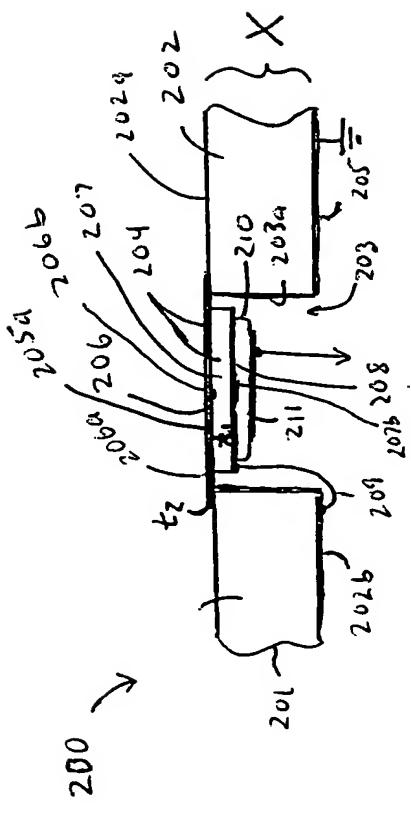
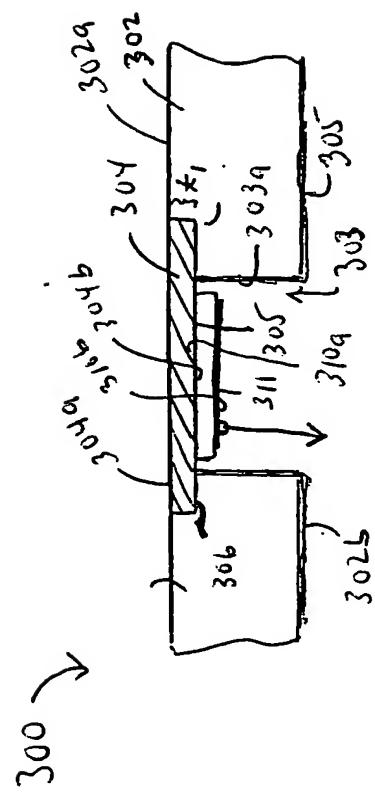


FIG. 2



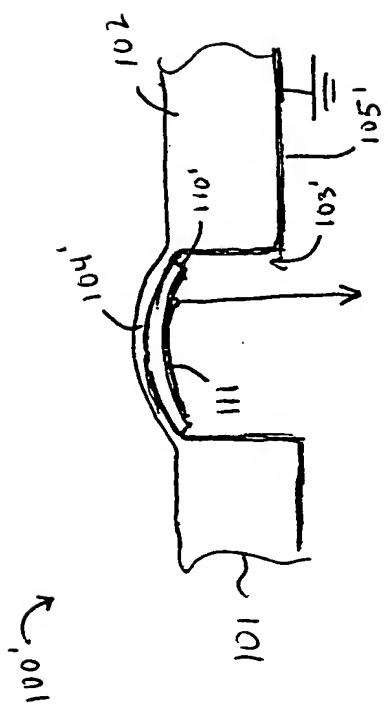


FIG. 4

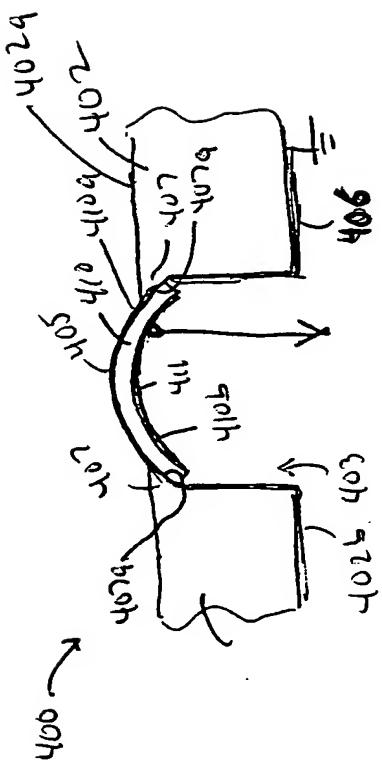


FIG. 5

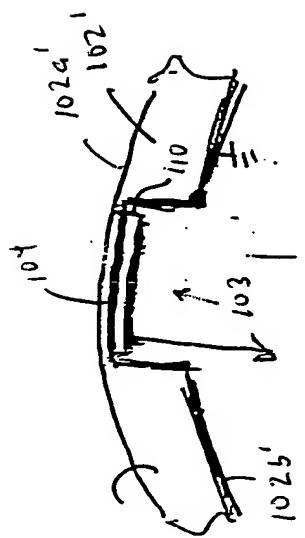


FIG. 6A

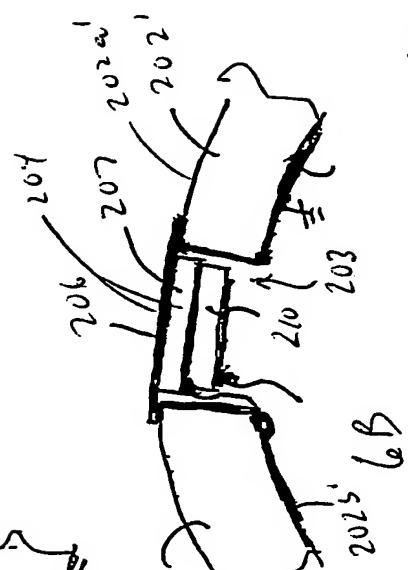


FIG. 6B

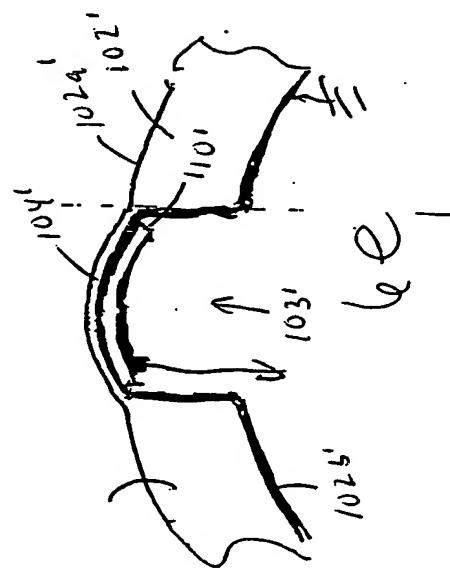
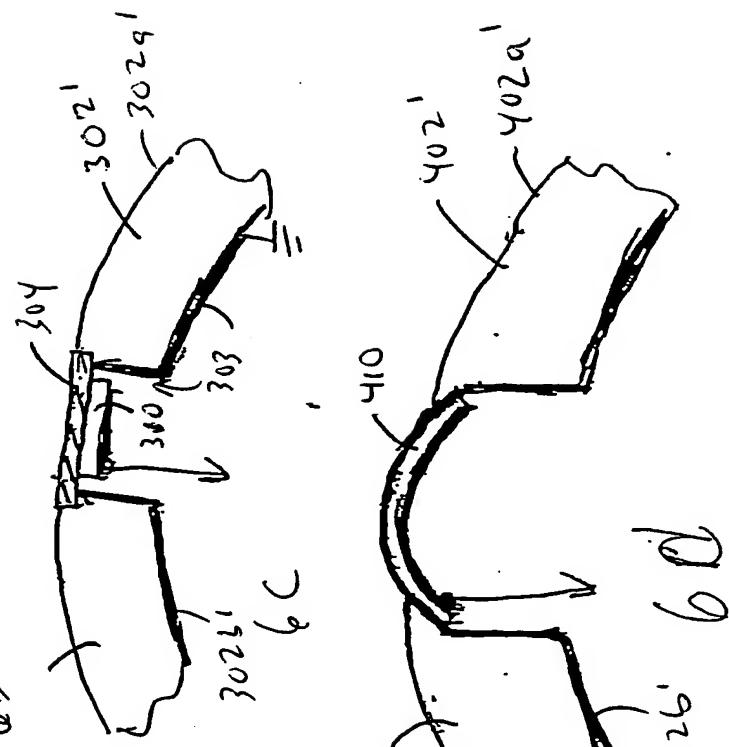


FIG. 6D

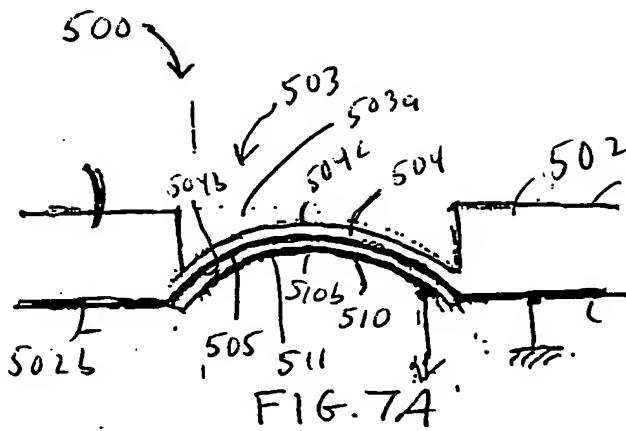


FIG. 7A

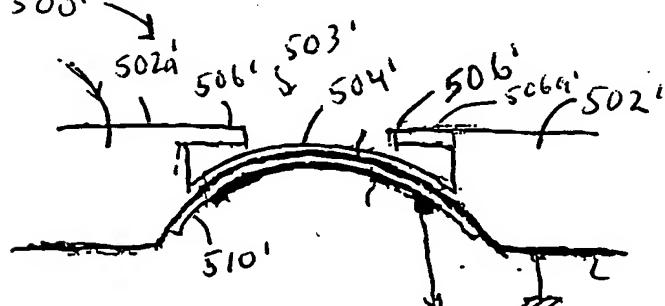
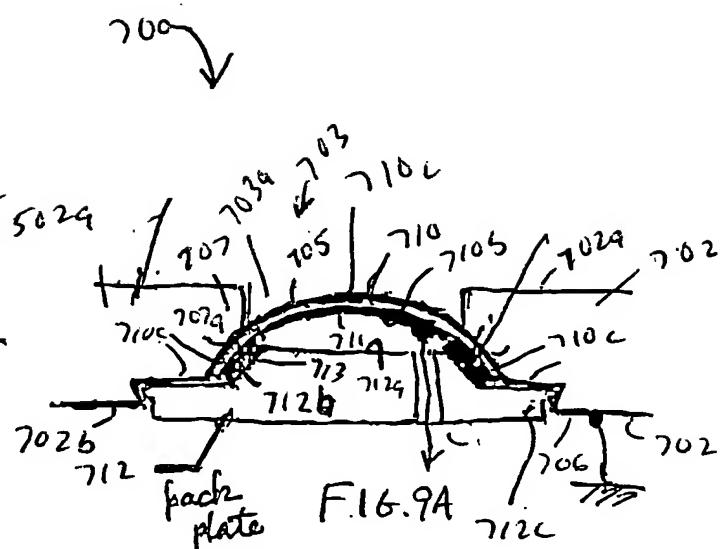


FIG. 7B



F.16.9A

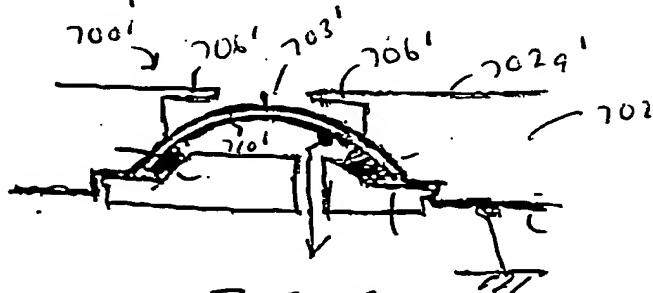


FIG. 9B

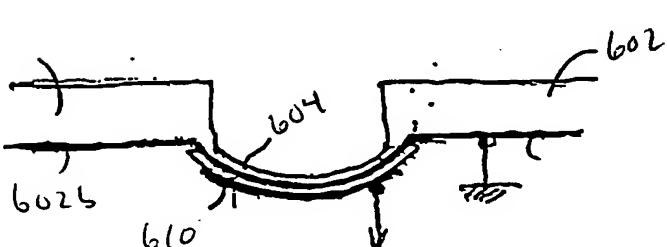


FIG. 8A

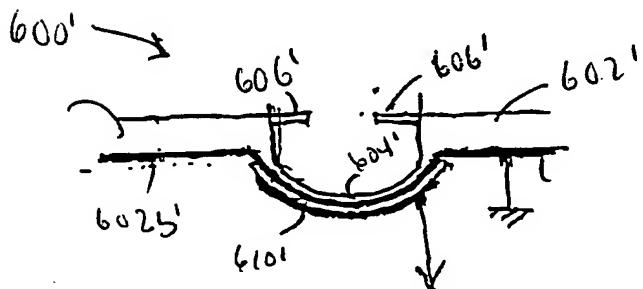


FIG. 8B

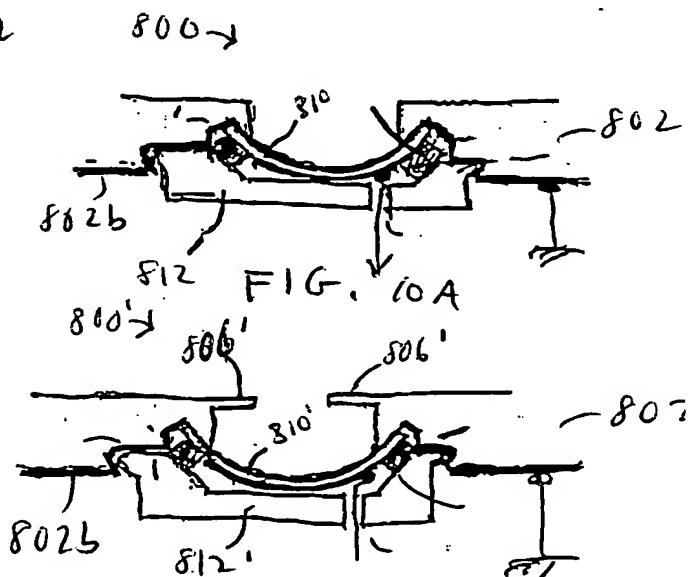


FIG. 10B

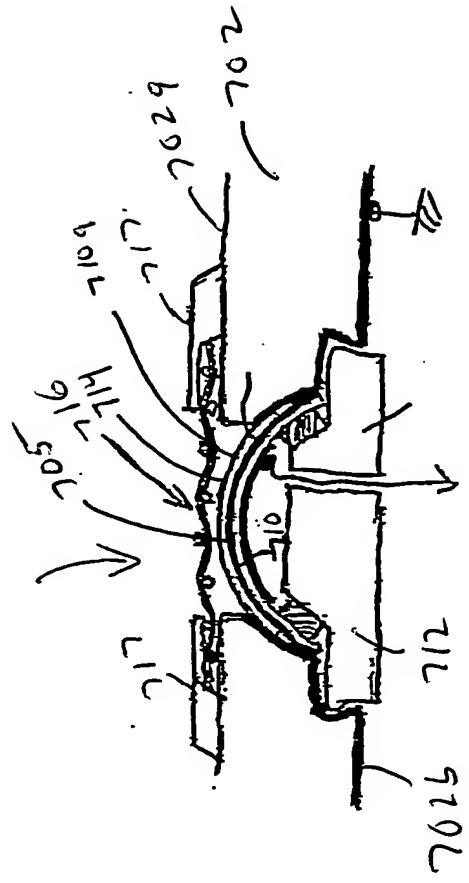


FIG. II

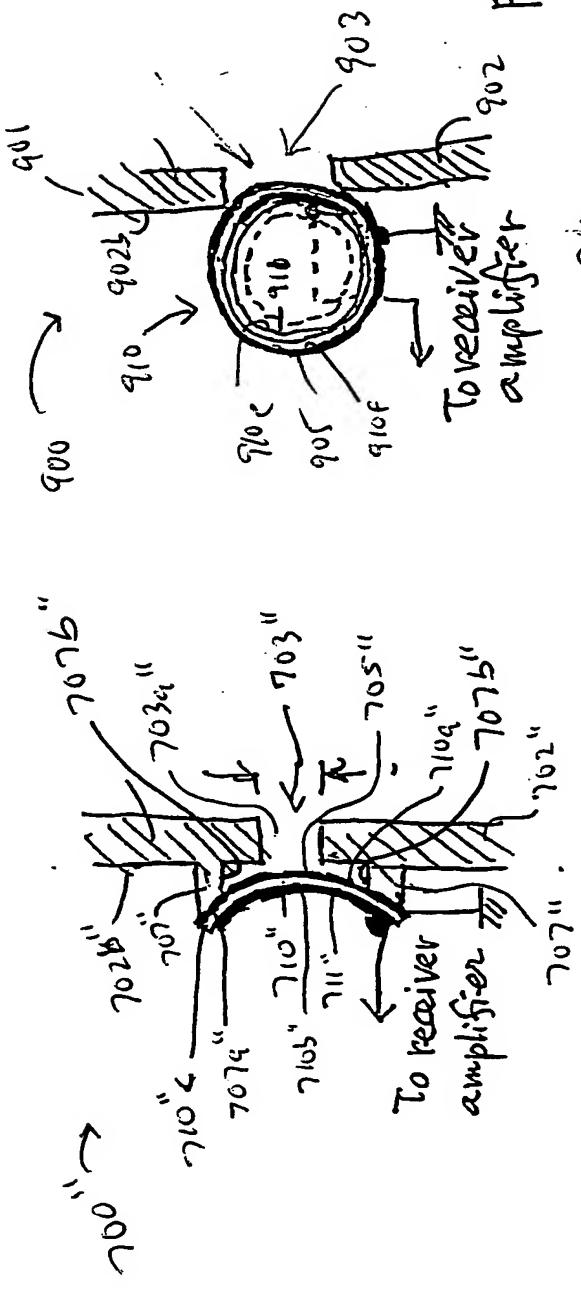


FIG. 12

To receiver
amplifier

902 FIG. 13

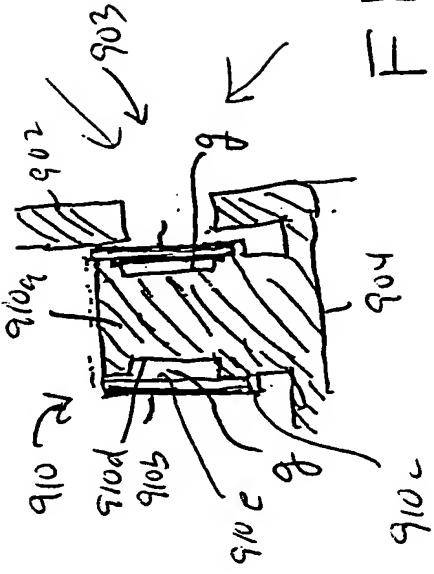
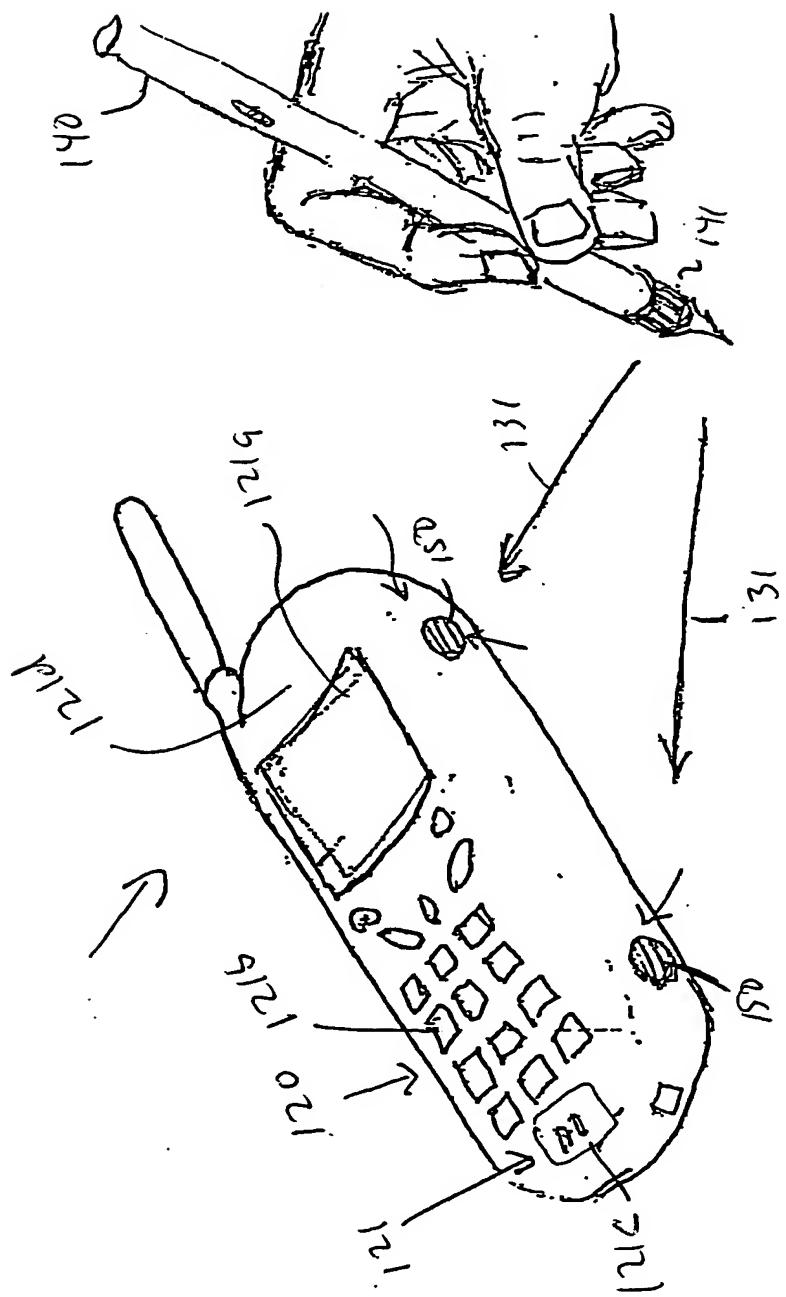


FIG. 15



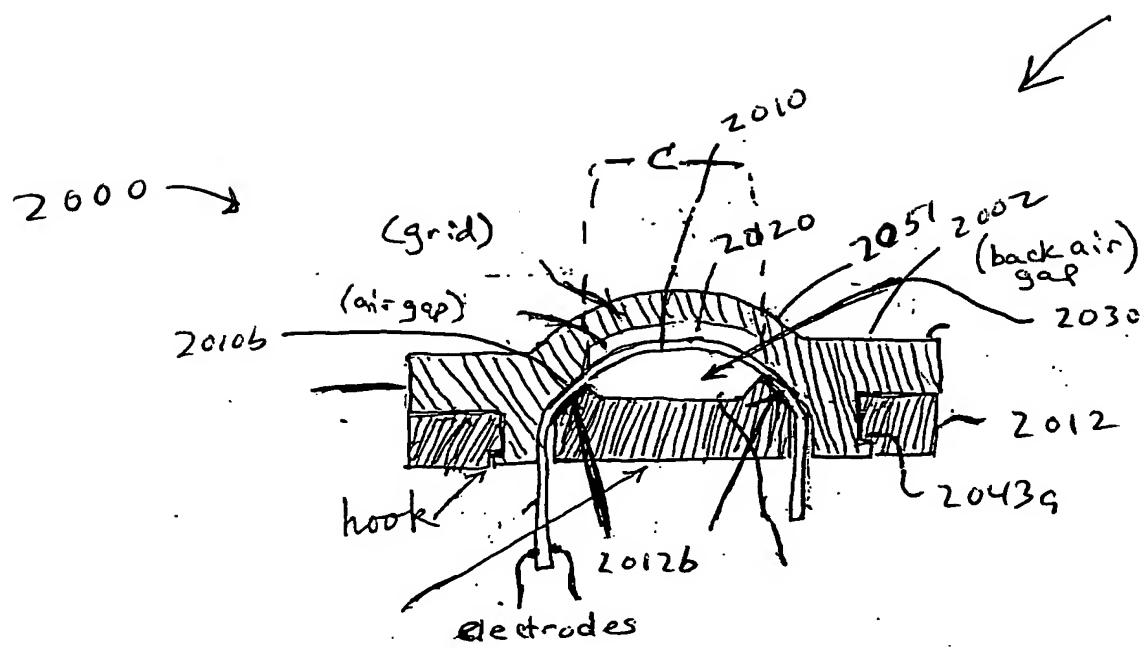


FIG. 16

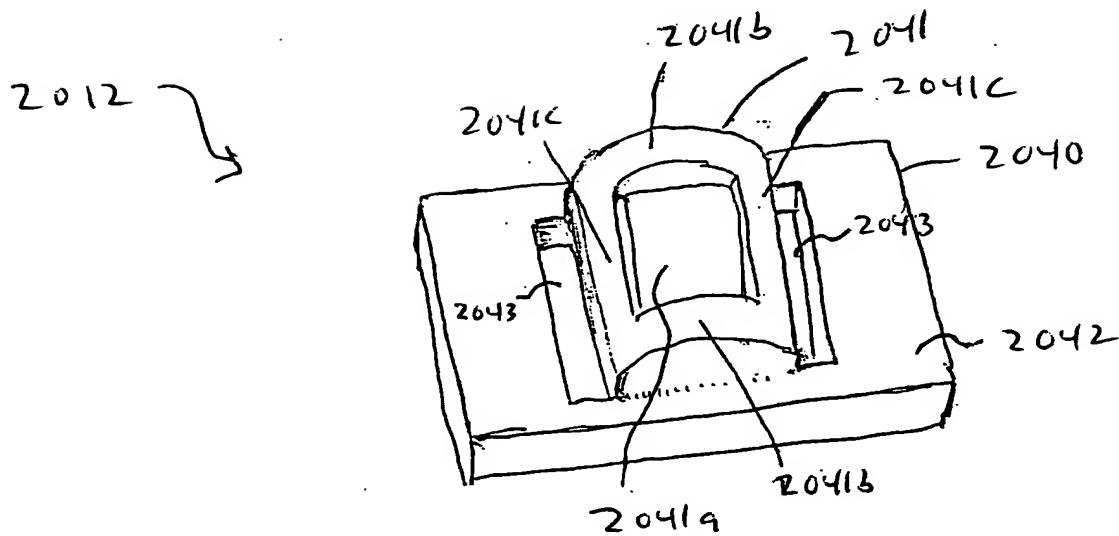
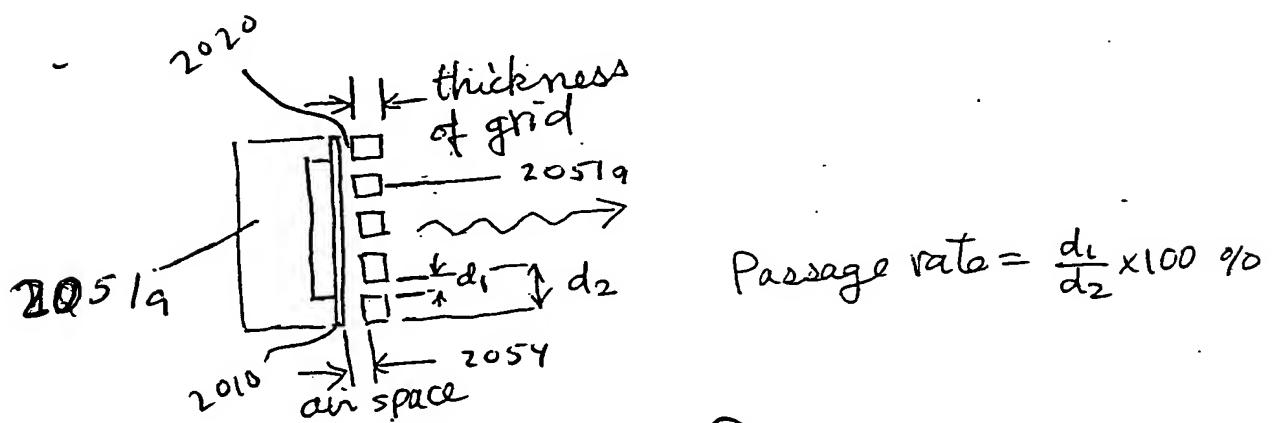
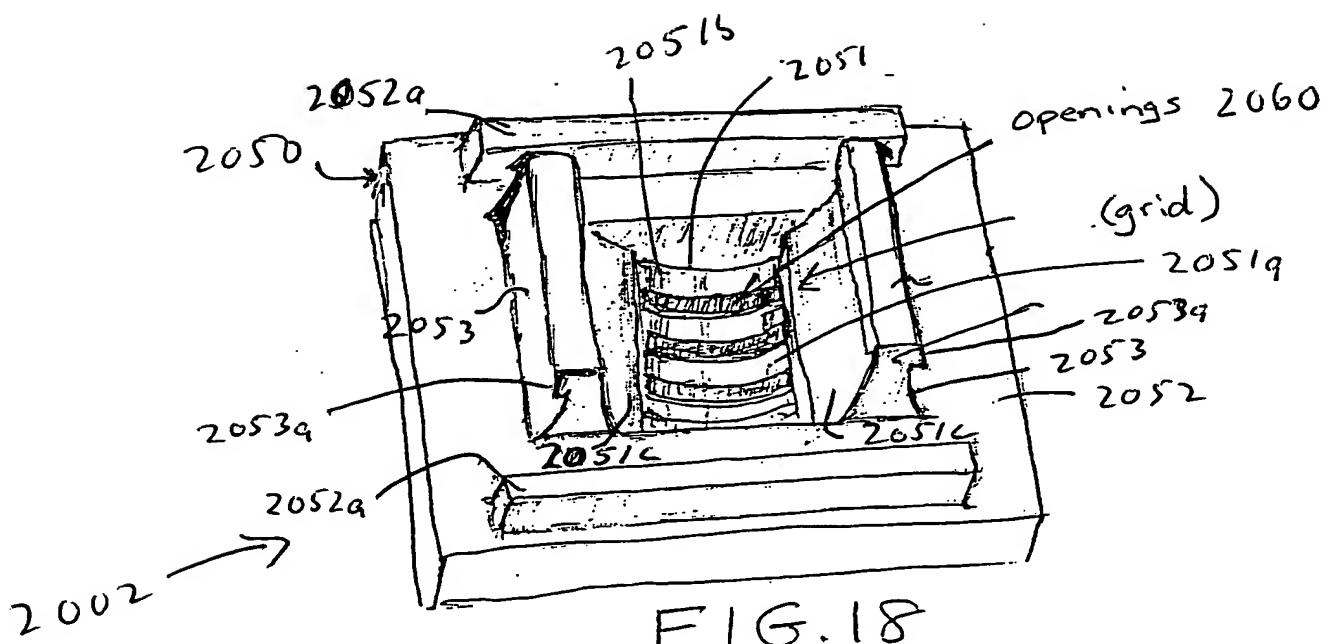


FIG. 17



30% passage			45% Passage			60%passage		
Air space	Wall Thick	Improvement	Air space	Wall Thick	Improvement	Air space	Wall thick	Improvement
0.08mm	0.5mm	82%	0.08mm	0.5mm	50%	0.1mm	0.5mm	38%
0.05	1.0	55	0.08	1.0	35	0.1	1.0	22
0.08	1.5	32	0.1	1.5	19	0.1	1.5	8

FIG. 23

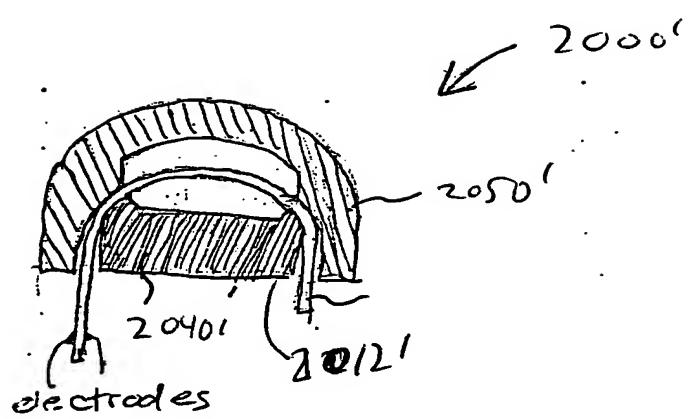


FIG. 20

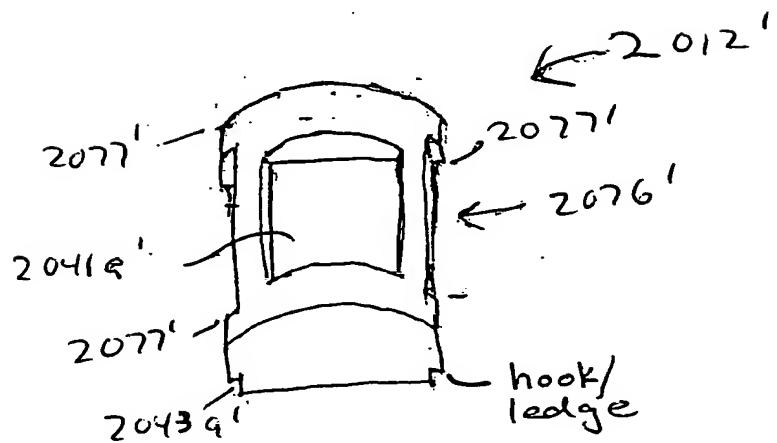


FIG. 21

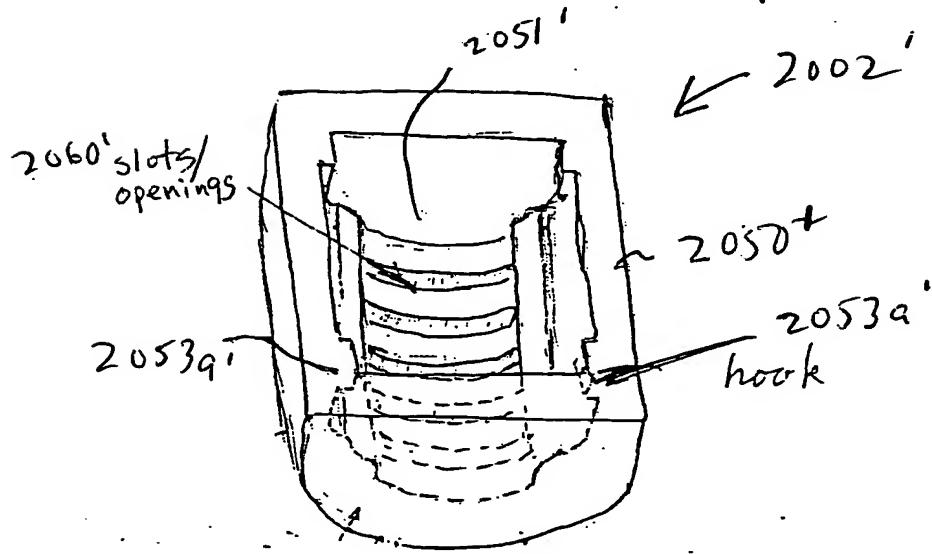


FIG. 22

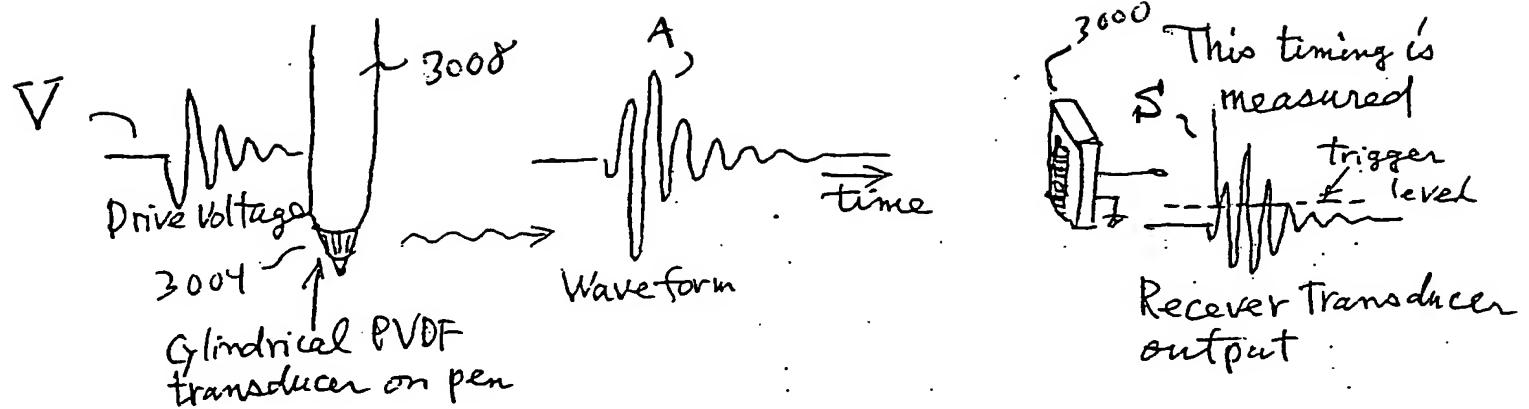


FIG. 24

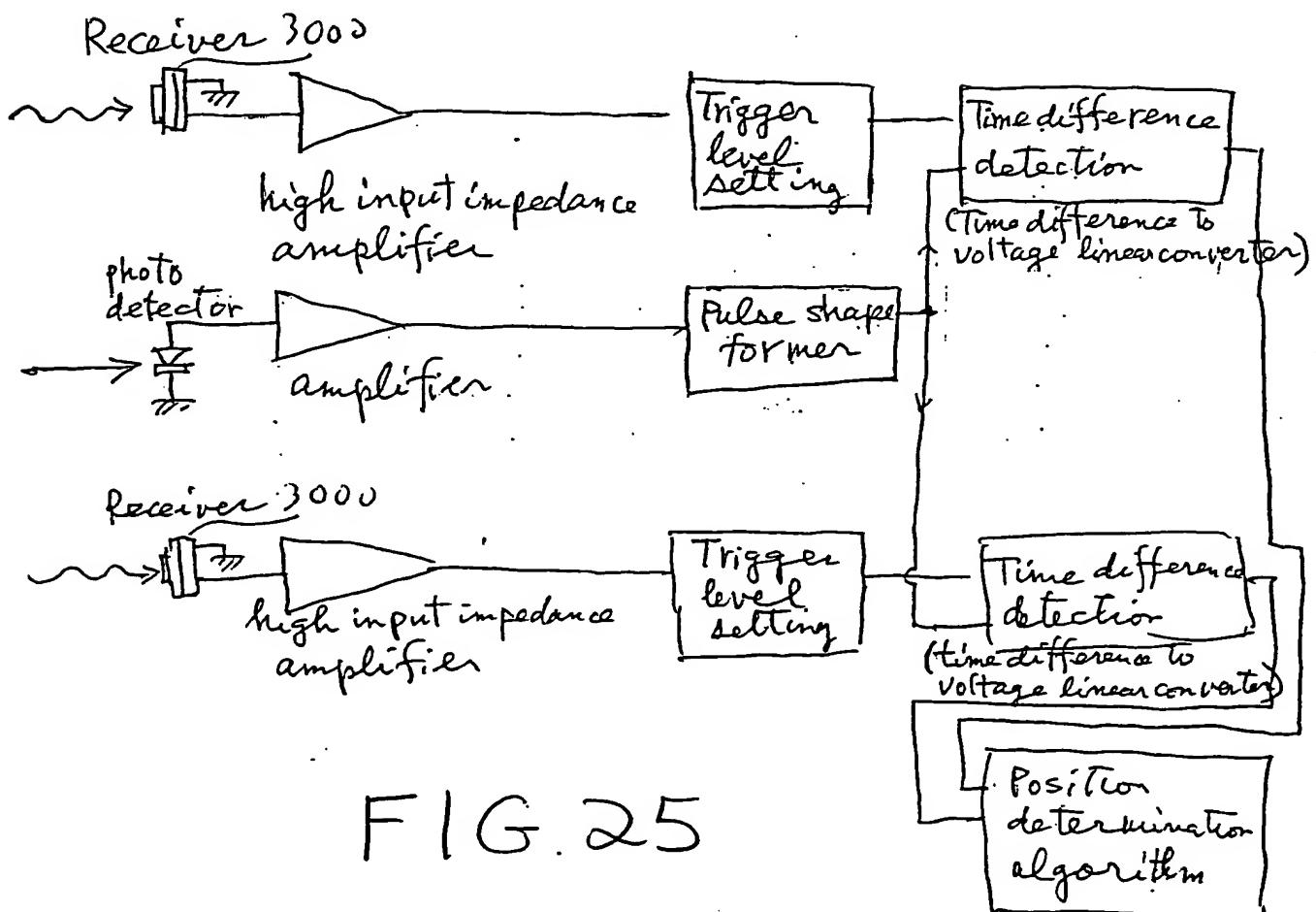


FIG. 25

FIG. 26

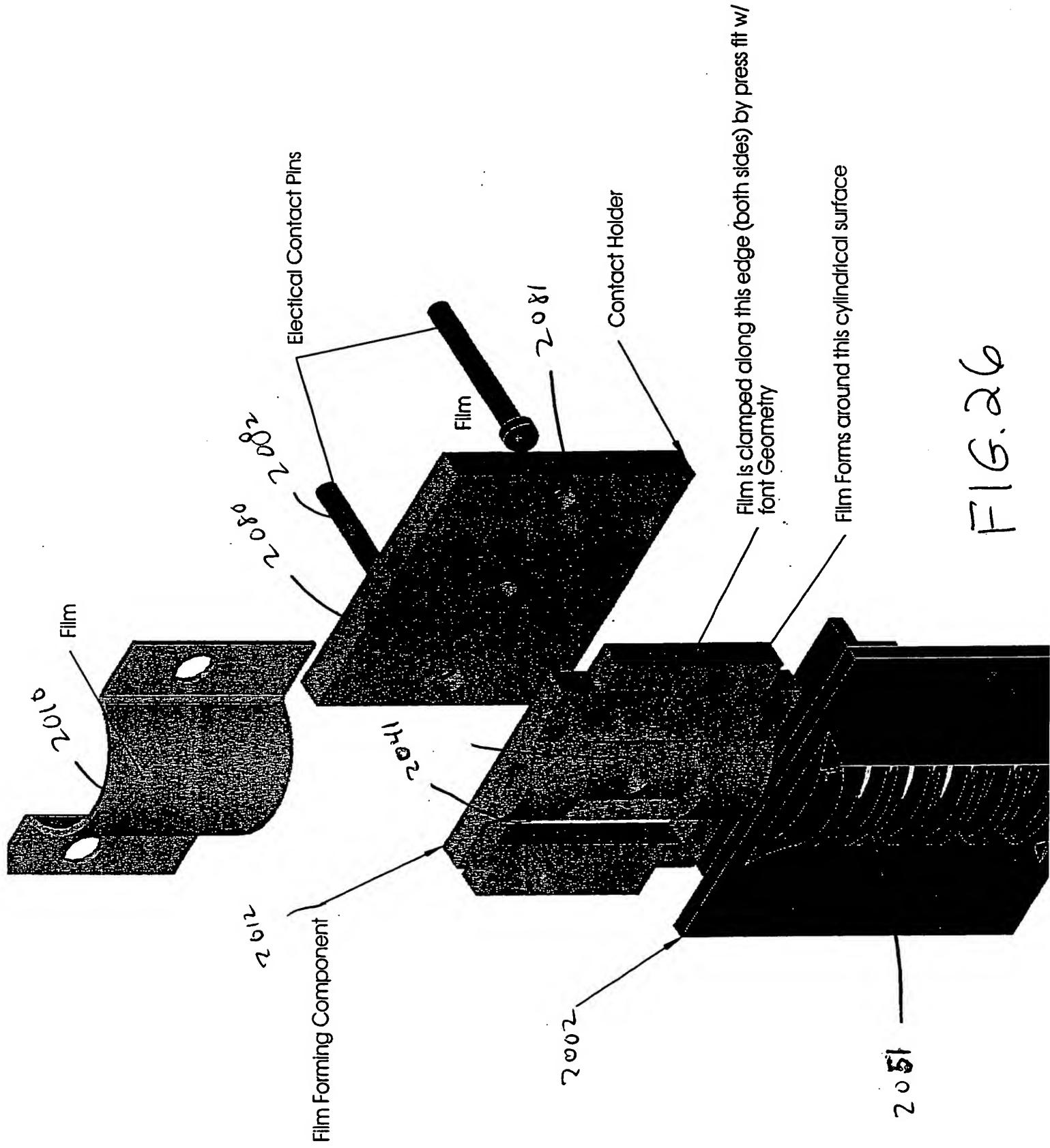
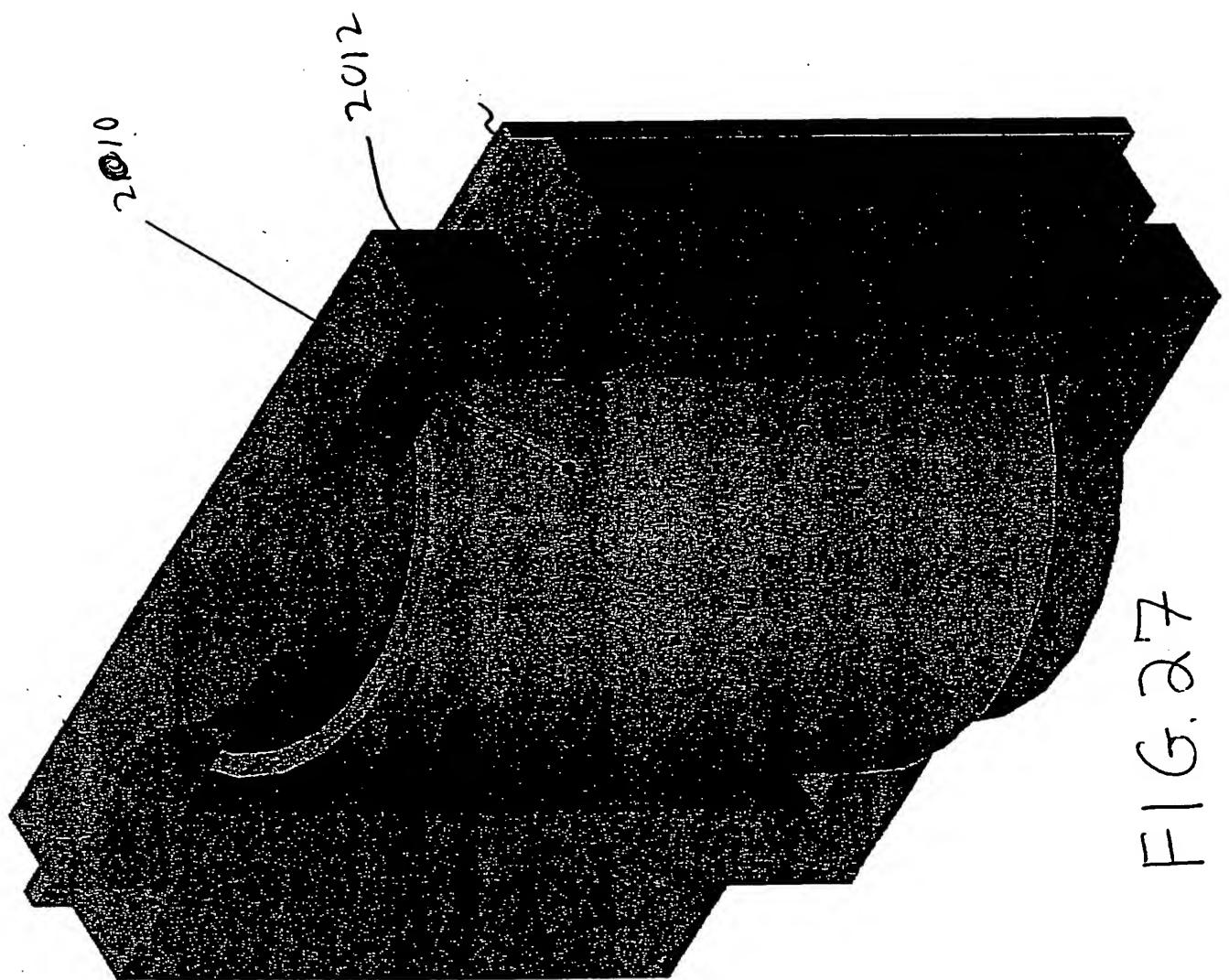


FIG. 27



Plastic contact holder can be ultrasonically welded to the two other plastic pieces of the assembly joining the entire assembly together

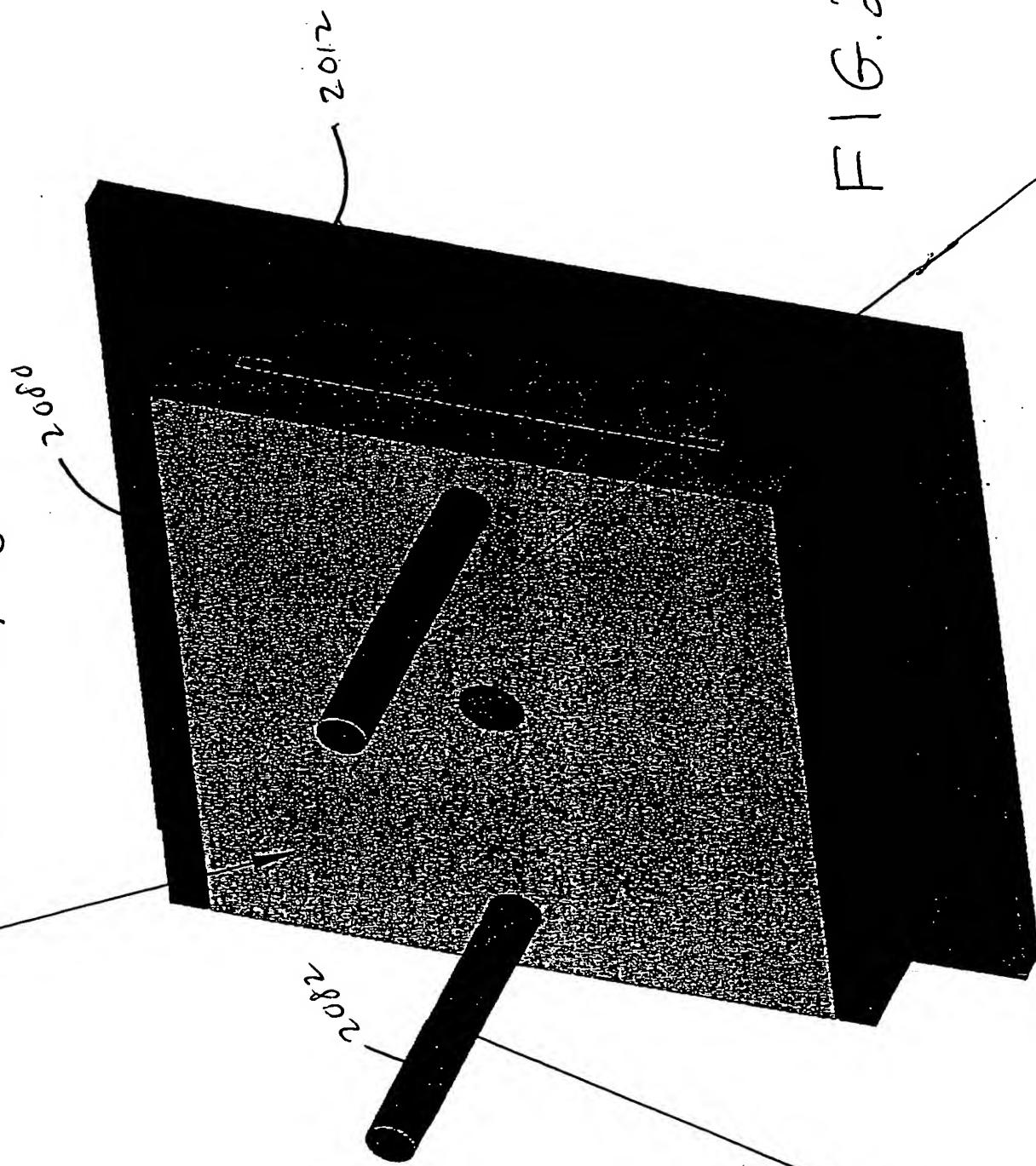
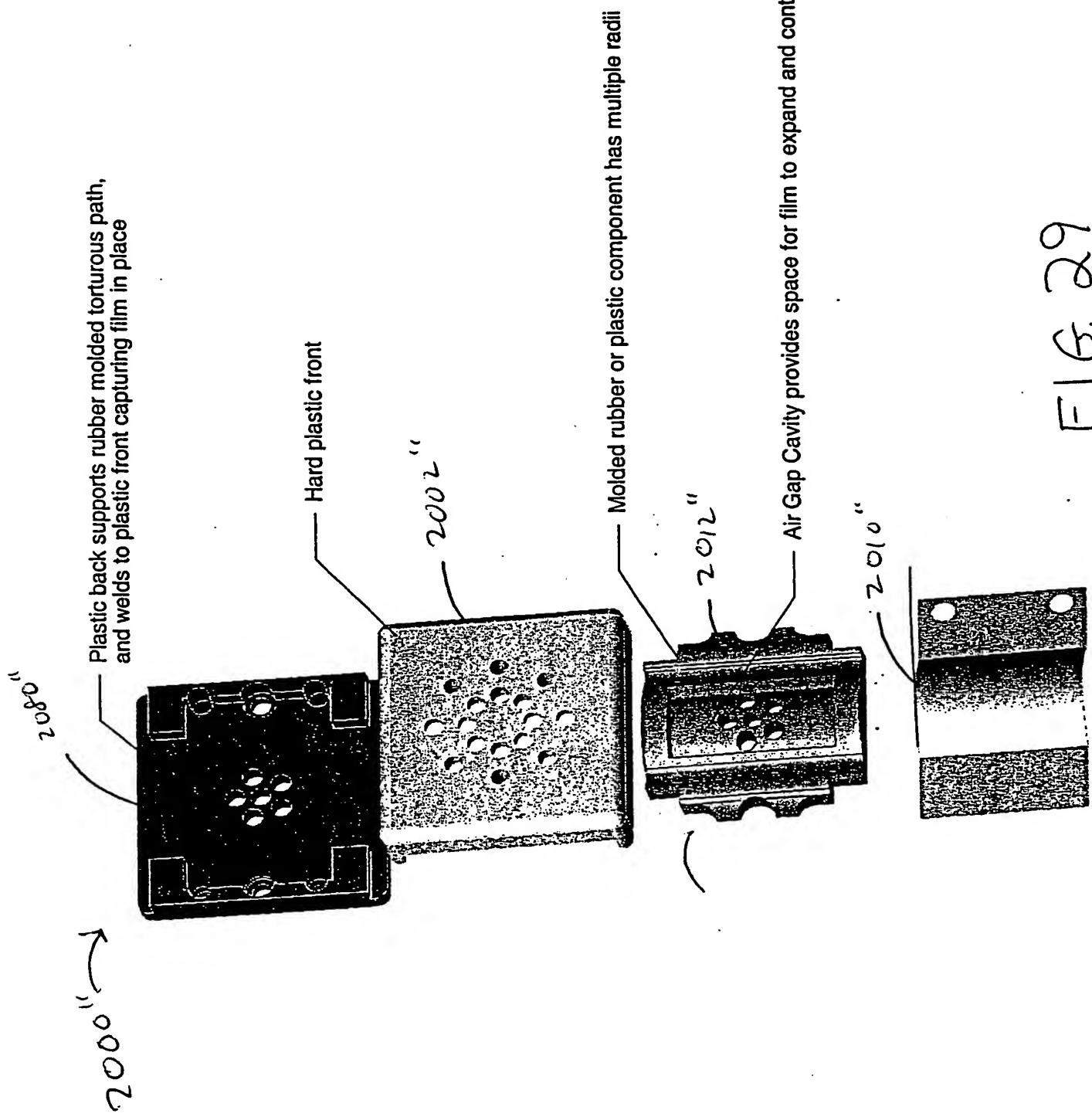


FIG. 28

Electrical contacts can be press fit or insert molded into The Plastic Contact holder and individually make contact to the positive and negative side of the Piezo Film

FIG. 29



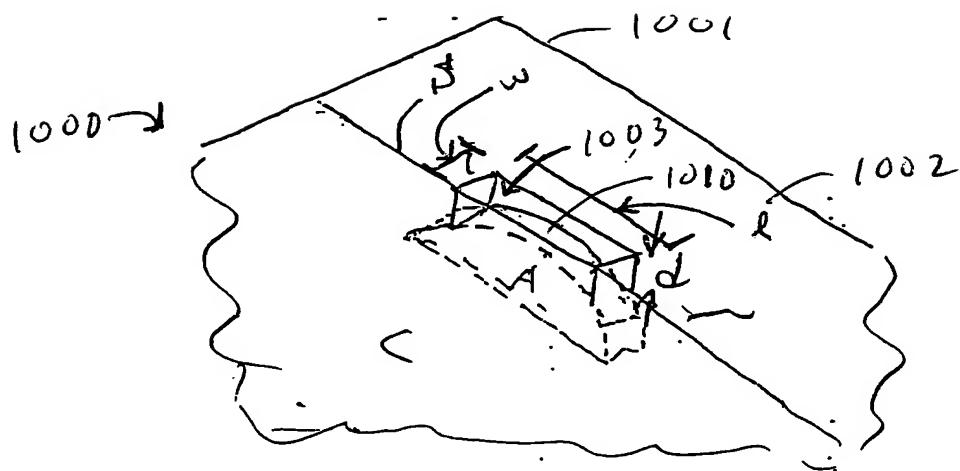


FIG. 30A

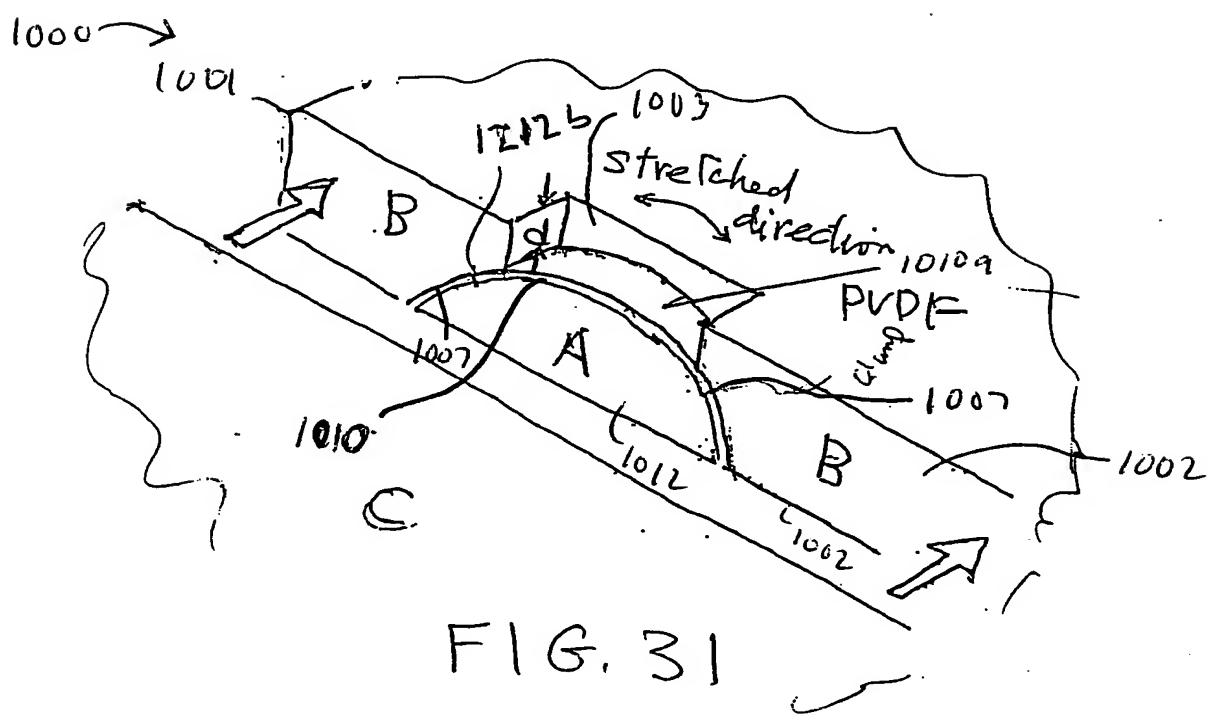


FIG. 31

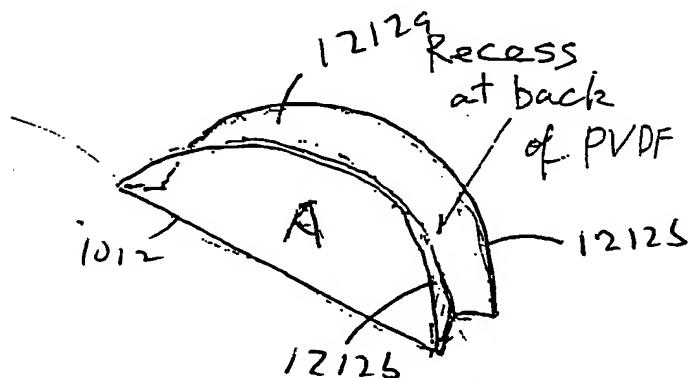


FIG. 32

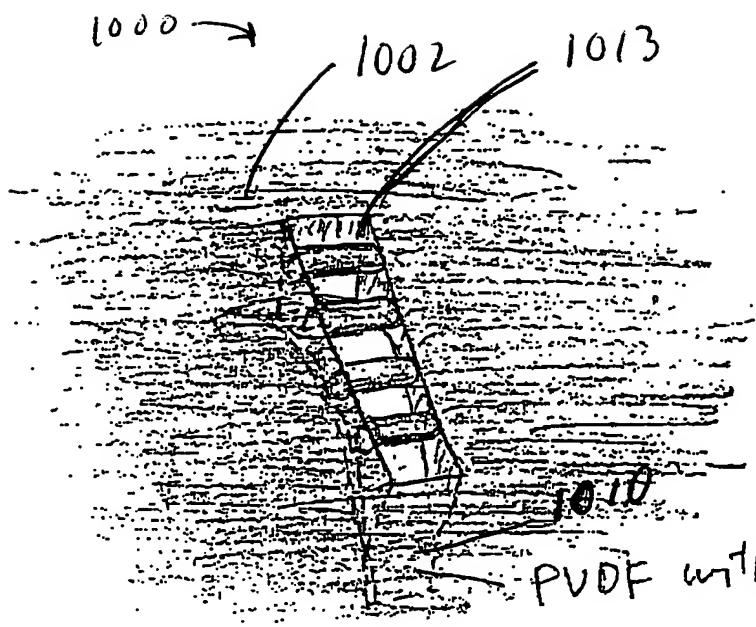


FIG. 30B

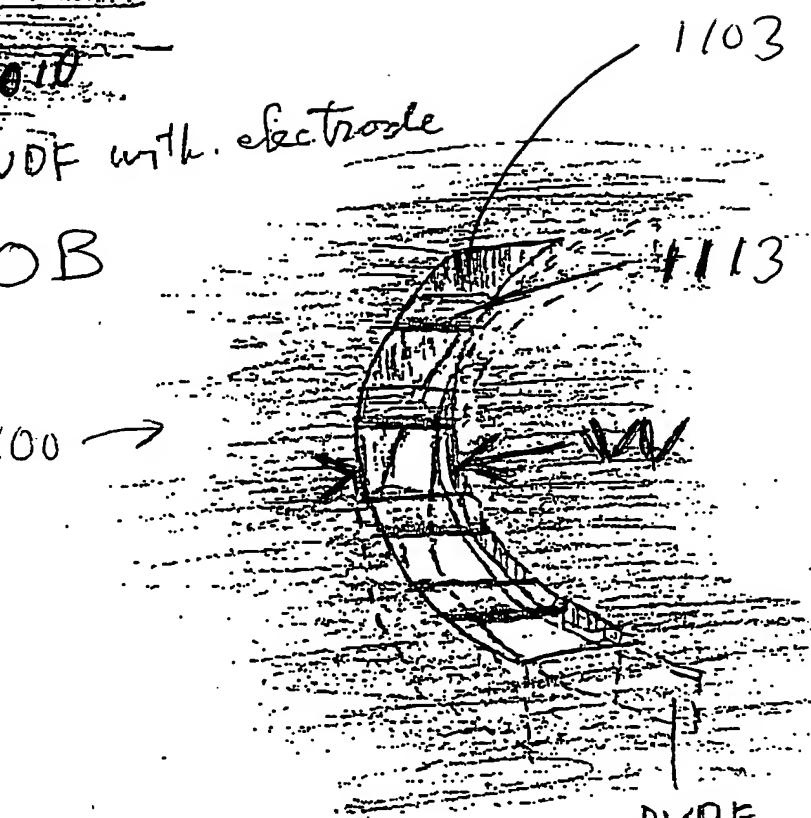


FIG. 33B

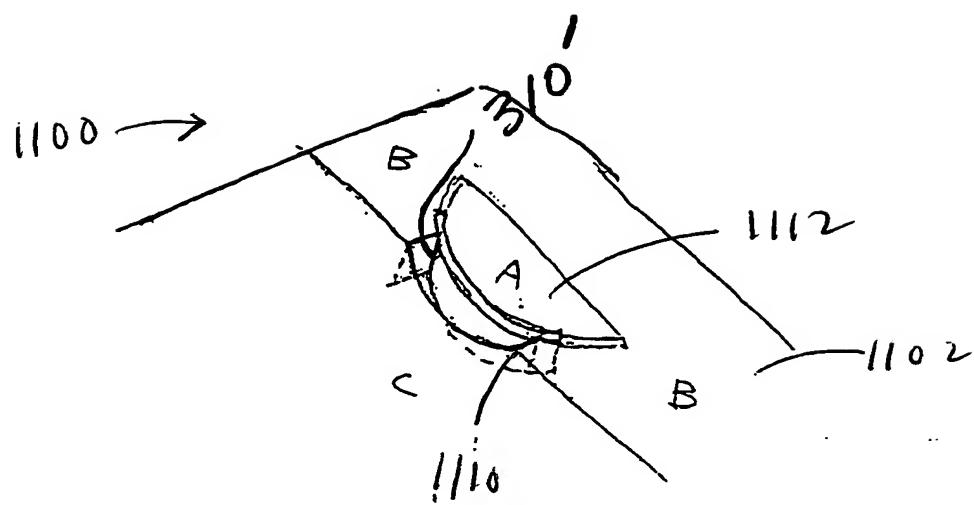


FIG. 33A

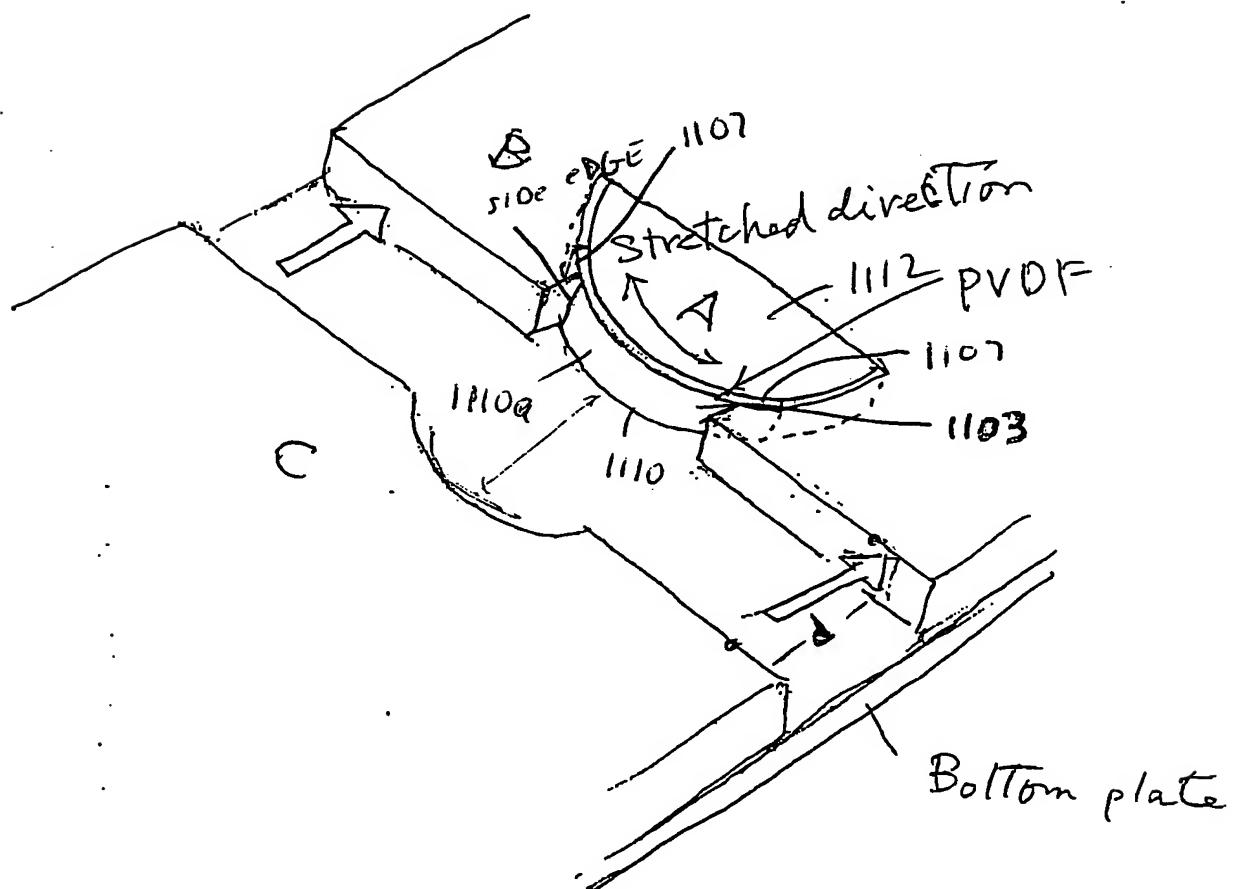


FIG. 34

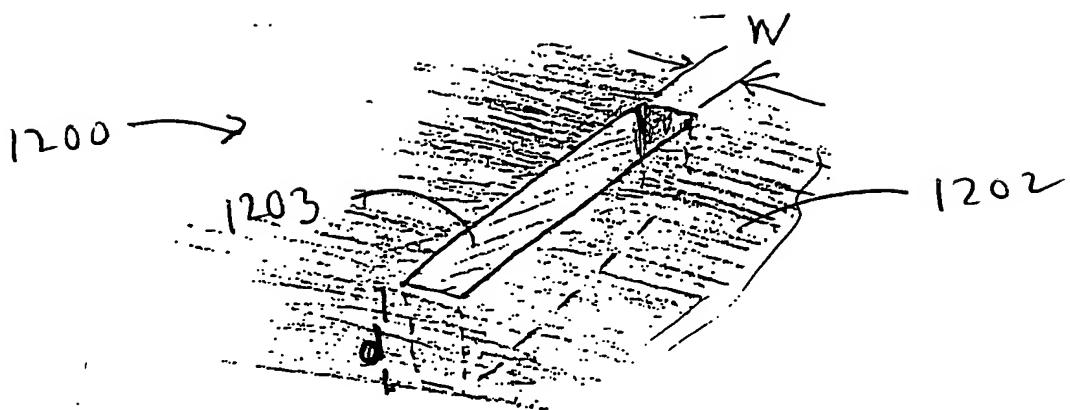


FIG. 35 A

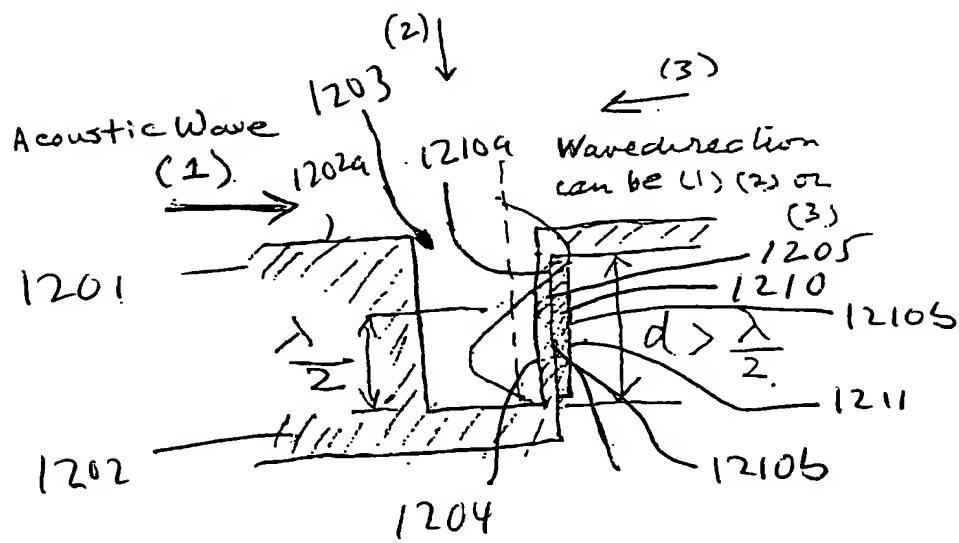
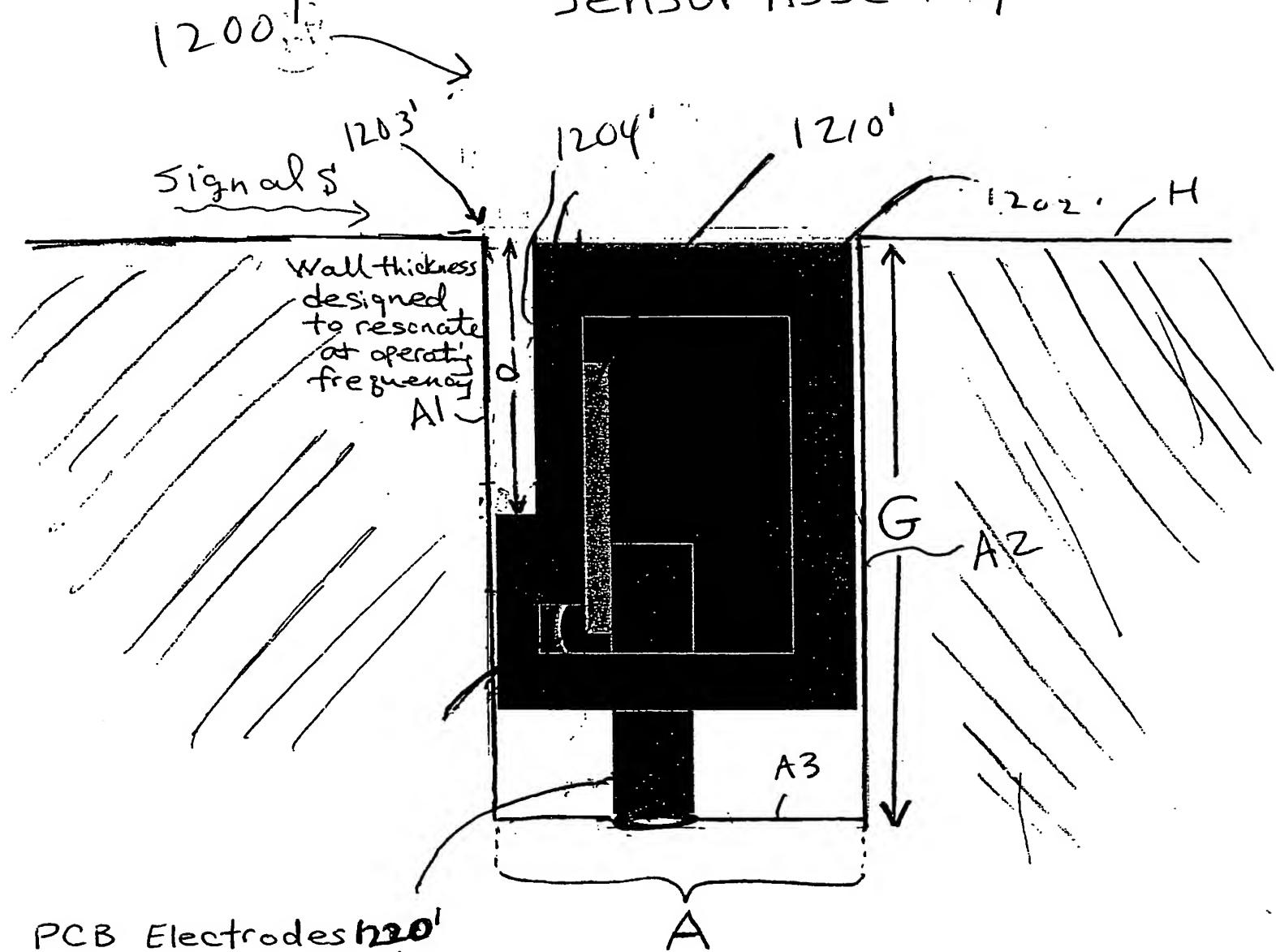


FIG. 35 E

Sensor Assembly



PCB Electrodes ~~1201~~
pass through Plastic,
metal, etc. housing
to connect to
main circuitry

FIG. 35G

Sensor Assembly

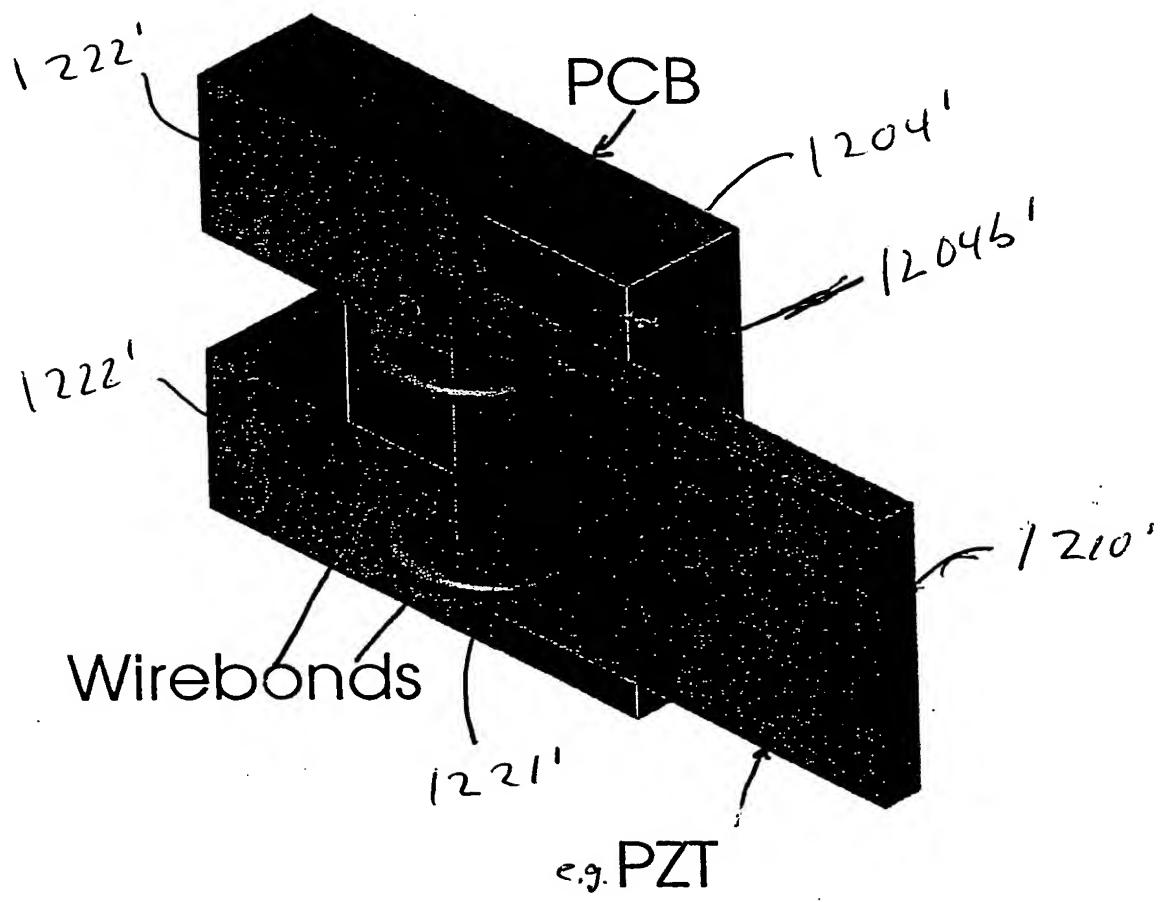
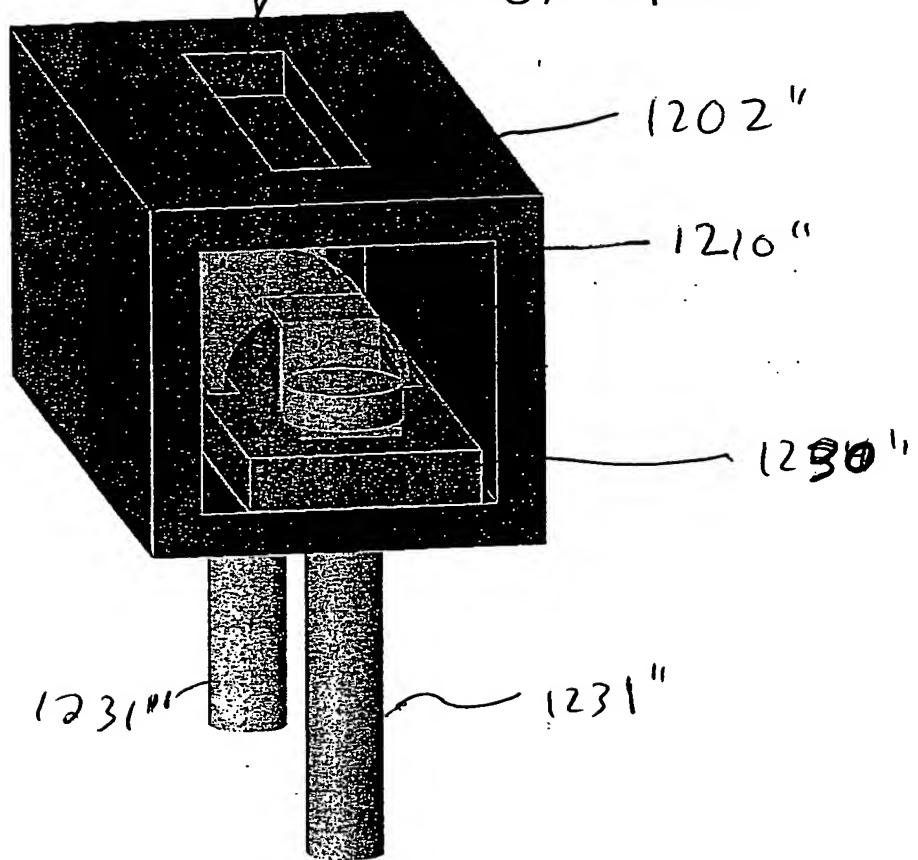


FIG. 35D

1200"

Semi-Cylindrical Sensor

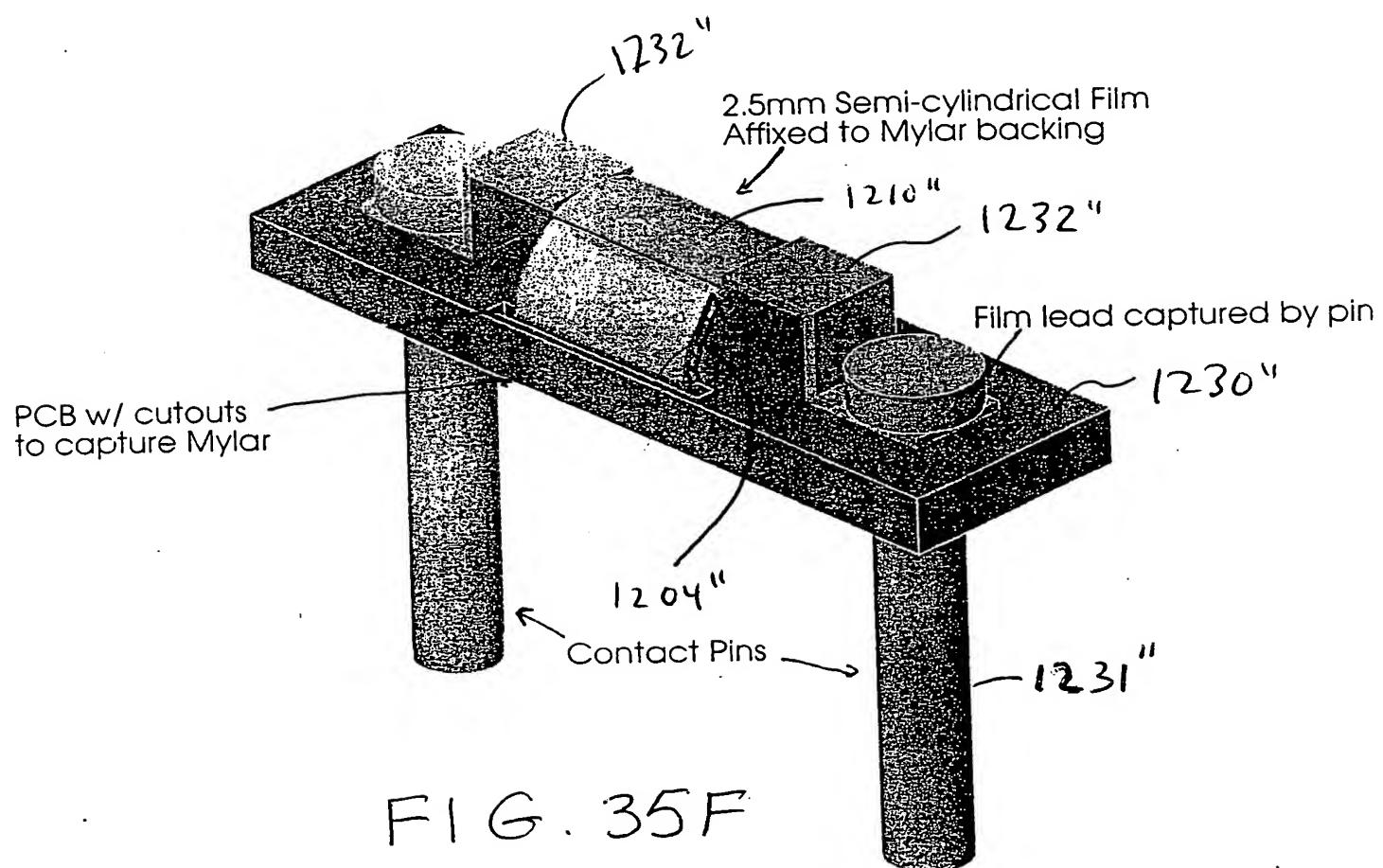
Plastic Housing w/
Cutout for Acoustic Energy to pass



Electric Contacts pass through
housing to connect to main circuit

FIG. 35 E

Semi Cylindrical Sensor



F I G . 35F

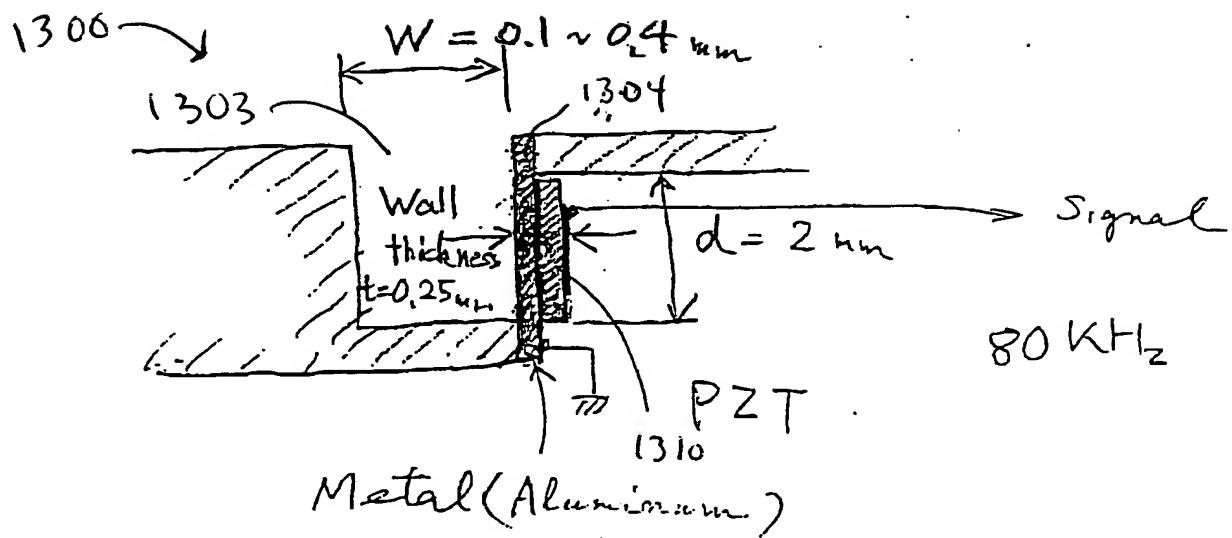


FIG. 36

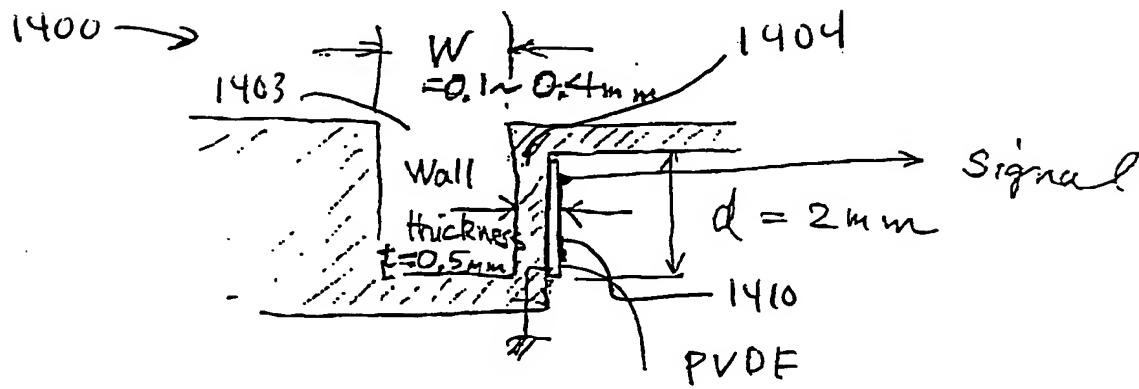
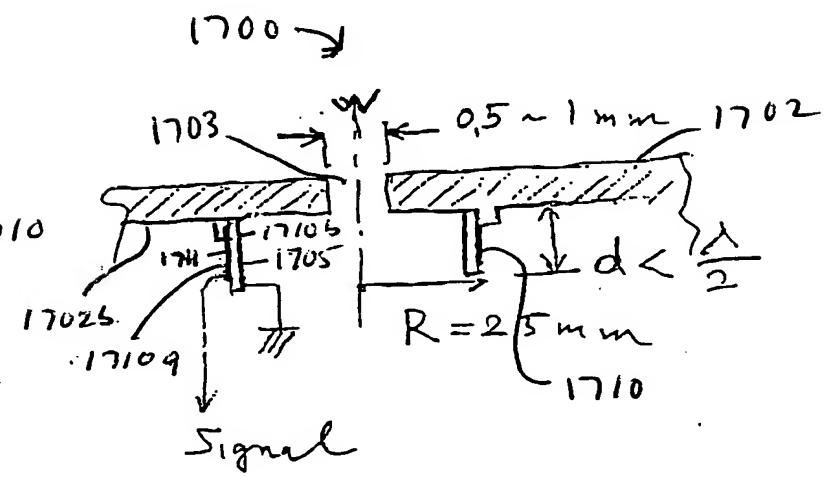
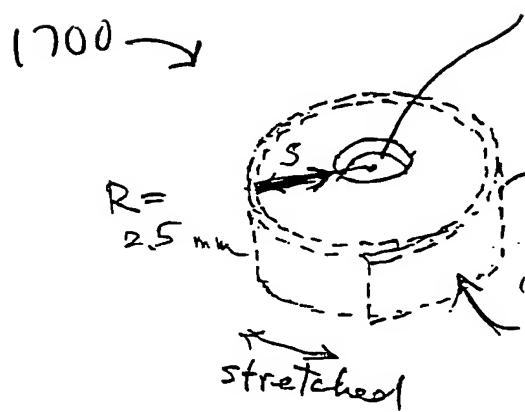
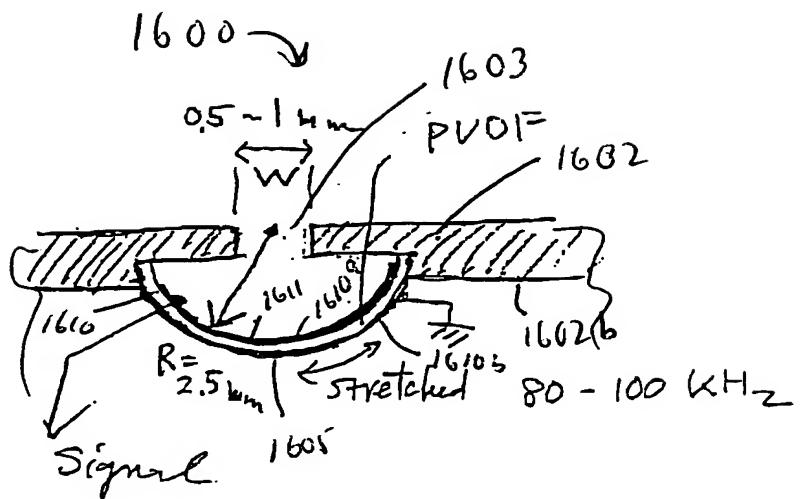
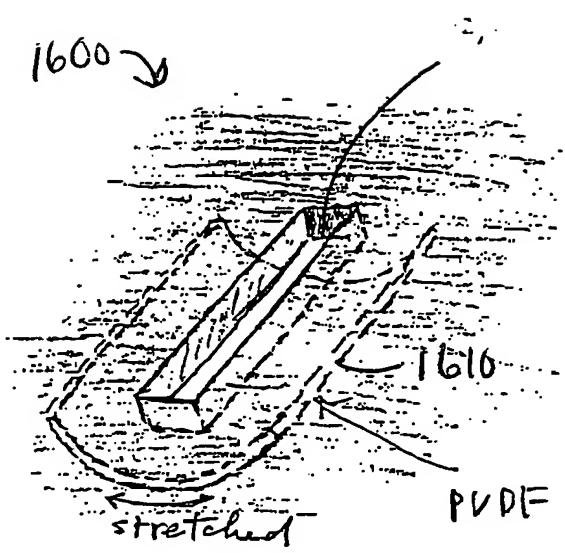


FIG. 37



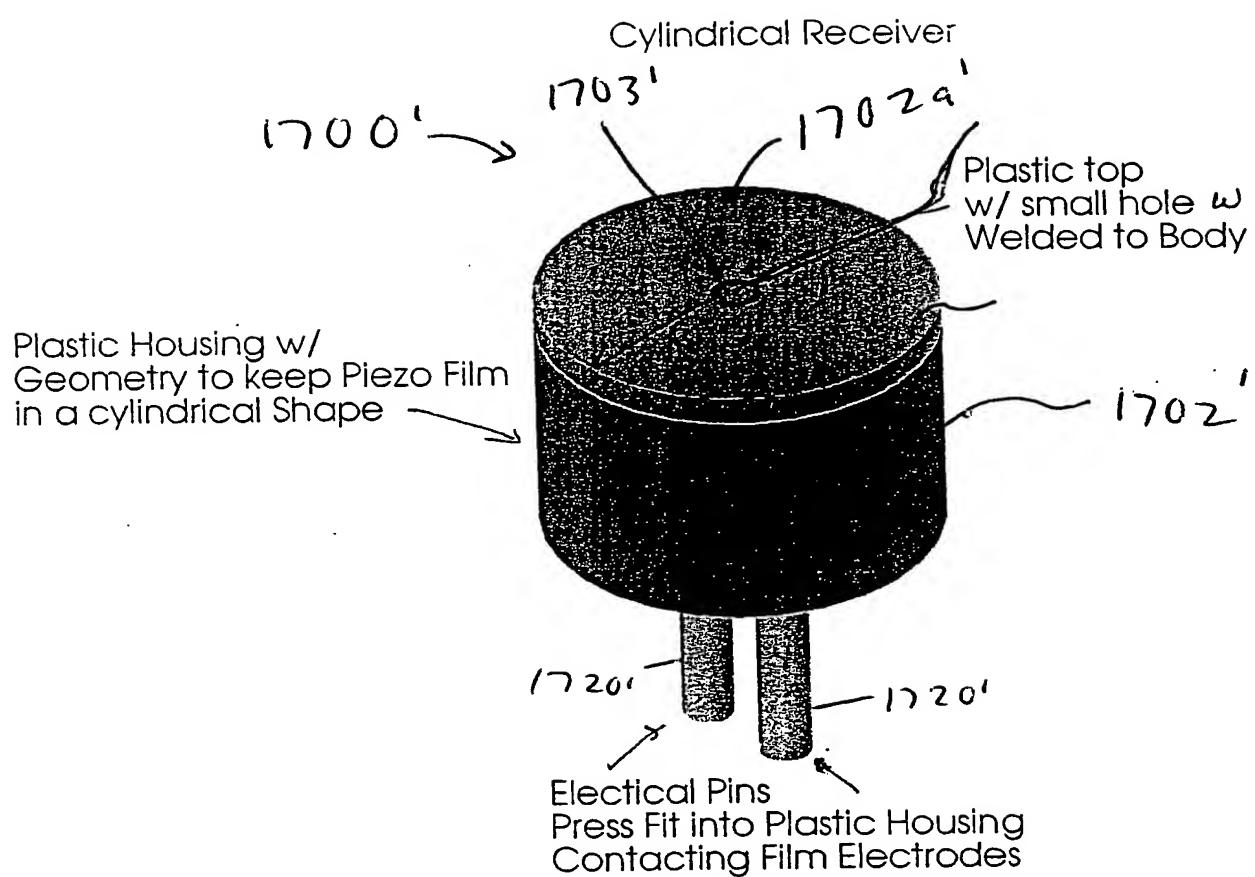


FIG. 39G

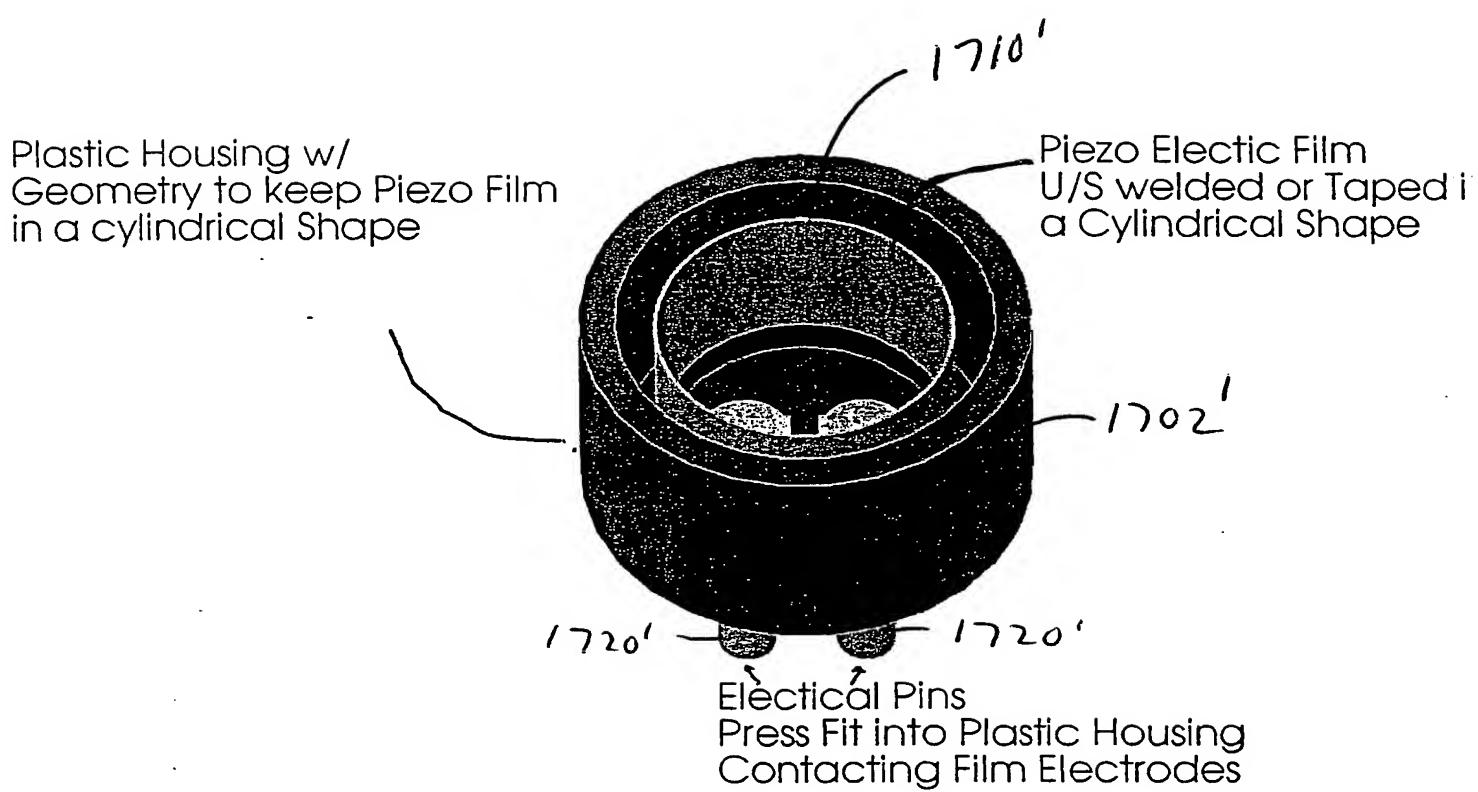


FIG. 39D

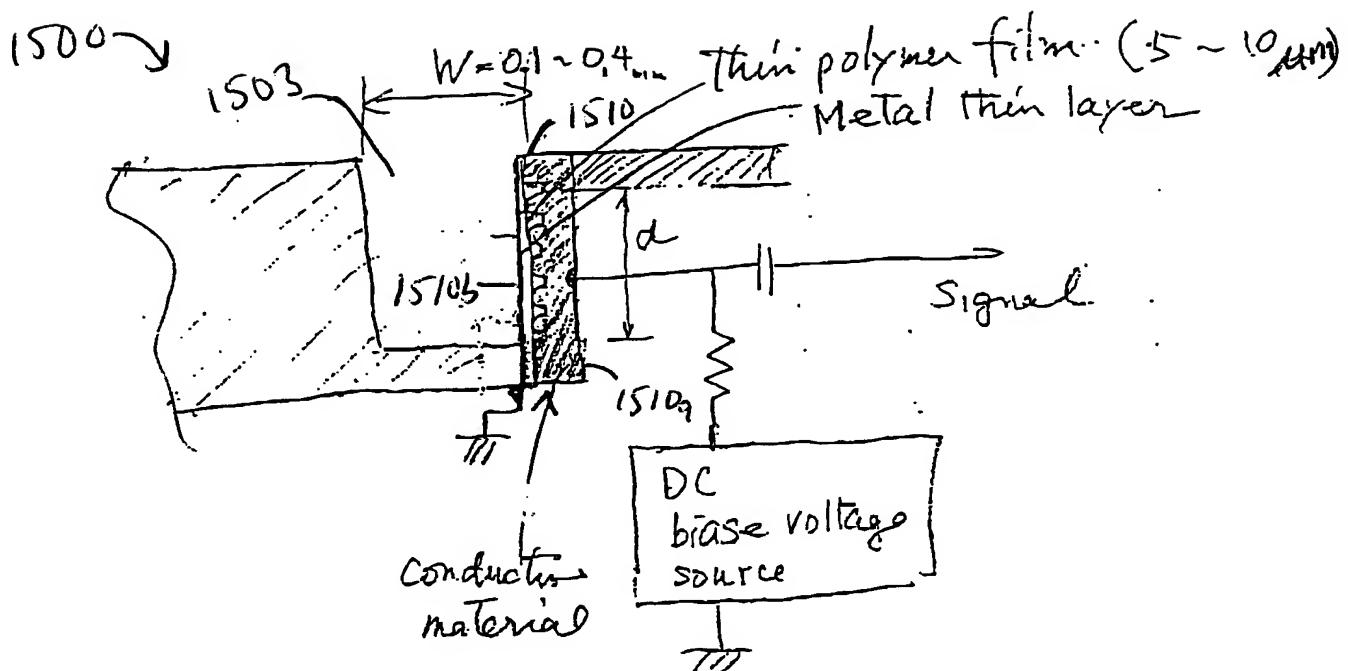


FIG. 40

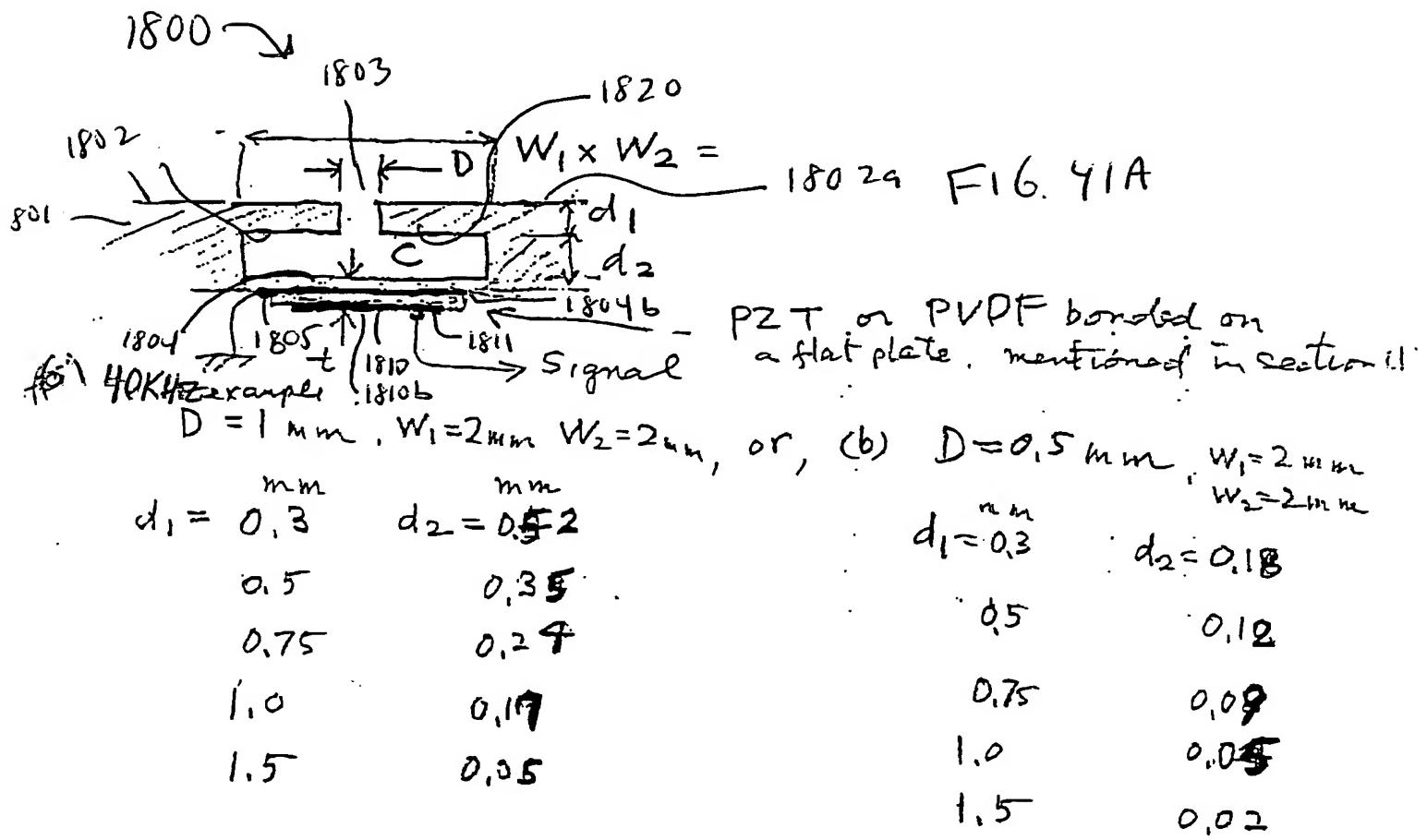


FIG. 41B

Capacitive Micro Machined Ultrasonic Transducer (c-MUT)

Following numbers are example of c-MUT diaphragm; material is silicon nitride.

(a) 1-2 MHz range design ($\lambda = 0.34 - 0.17$ mm)

Diaphragm diameter ; 50 μm , thickness 0.5 – 1 μm

(b) 300 - 900 KHz ; ($\lambda = 1.1 - 3.8$ mm)

Diaphragm diameter ; 200 μm , thickness 2.5 – 7.5 μm

(c) 80 - 200 KHz design ; ($\lambda = 4.3 - 1.7$ mm)

Diaphragm diameter 0.4 mm, thickness 3 - 7 μm

In all the design, the diameters are roughly equal to quarter wavelength or smaller. In such a condition, the sensitivity has no angle dependence (no directivity).

Such a transducer can be mounted on the surface of receiving equipment.

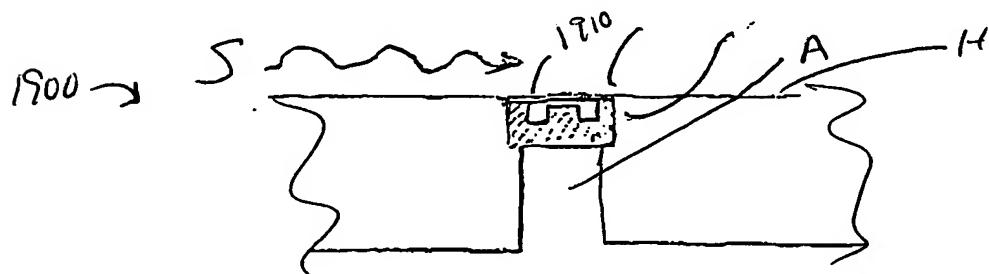


FIG. 42

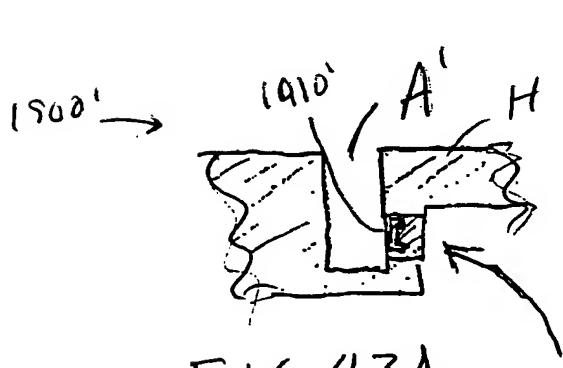


FIG. 43A

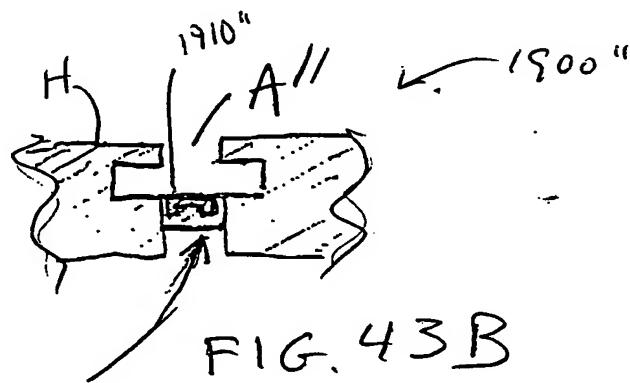


FIG. 43B

Desktop computer,

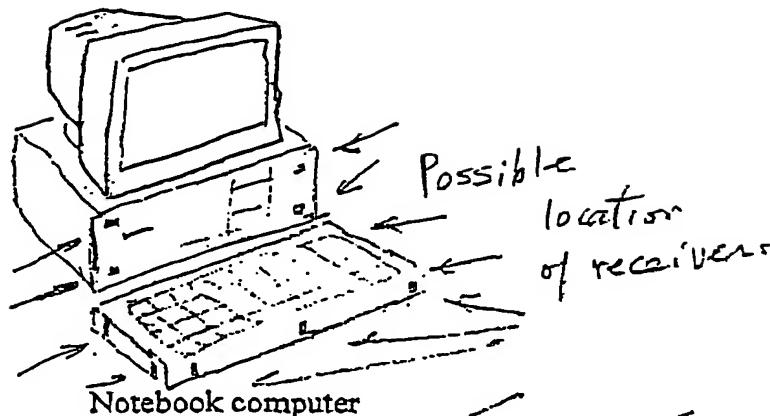


FIG. 44A

Notebook computer

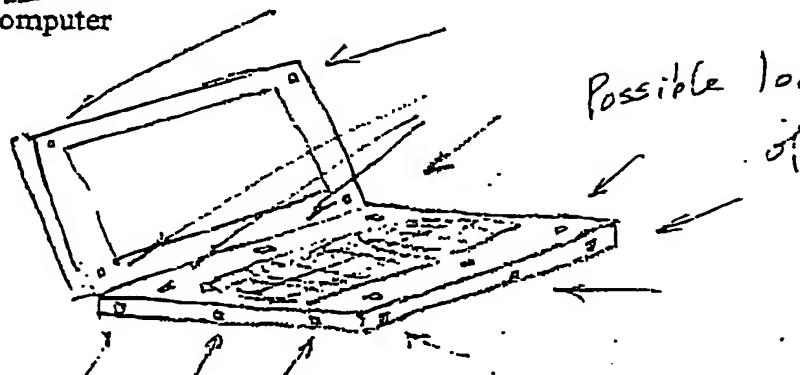


FIG. 44B

PDA

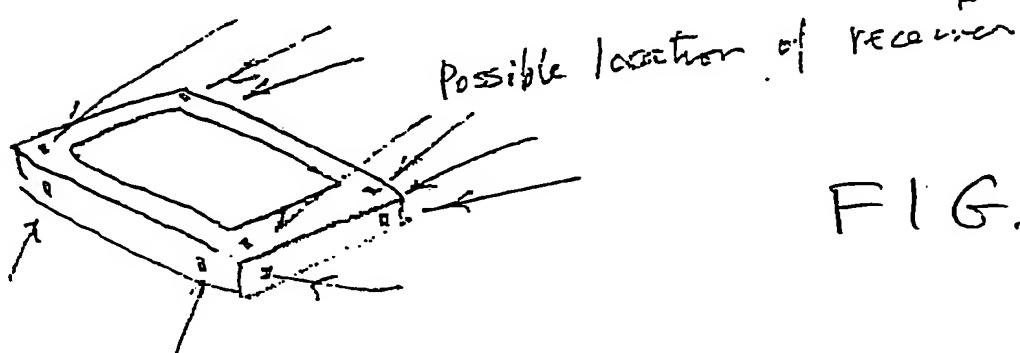


FIG. 44C

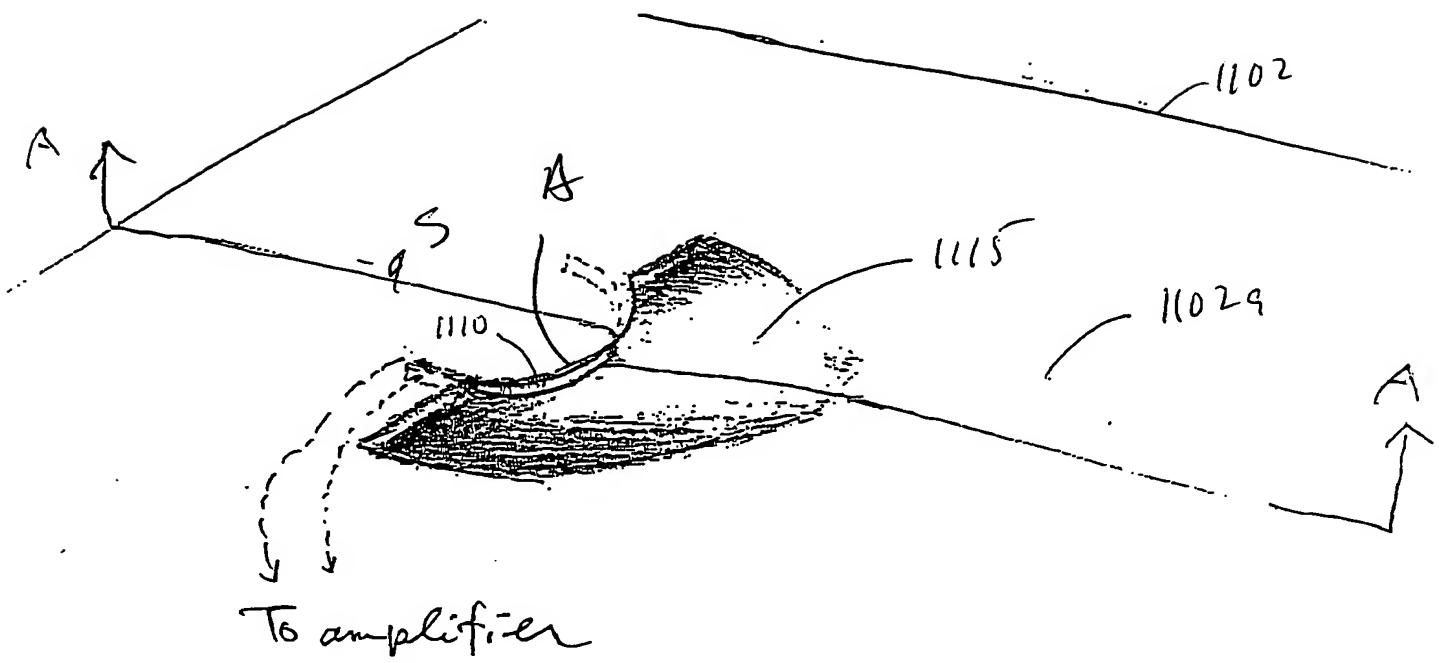


FIG. 45A

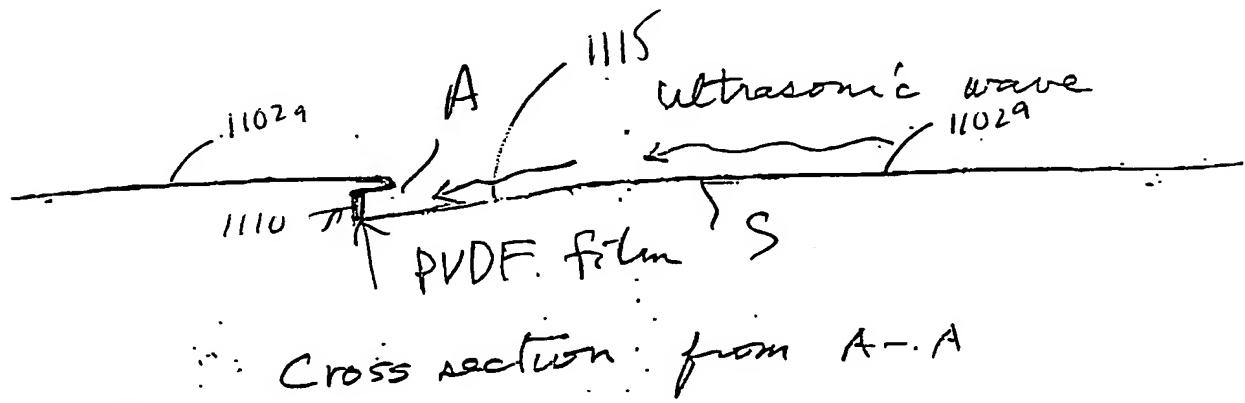


FIG. 45B

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER: _____**

IMAGES ARE BEST AVAILABLE COPY.
As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.